VILLAGE OF NORTH AURORA
Crossroads on the Fox

AGENDA
NORTH AURORA VILLAGE BOARD MEETING
MONDAY, OCTOBER 17, 2016 – 7:00 p.m.
NORTH AURORA VILLAGE HALL - 25 E. STATE ST.

CALL TO ORDER - SILENT PRAYER - MEDITATION - PLEDGE OF ALLEGIANCE

ROLL CALL

AUDIENCE COMMENTS

TRUSTEE COMMENTS

CONSENT AGENDA

1. Approval of Village Board Minutes dated 10/03/2016; Approval of Committee of the Whole Minutes dated 10/03/2016
2. Approval of the Release of Executive Session Minutes dated 11/10/2008, 11/24/2016 Sessions I, II, & III, 12/8/2008, Sessions I, II, III & IV; 12/7/2009 Session II; 8/16/2010; 9/21/2015; 1/18/2016; 3/7/2016; and 4/4/2016

NEW BUSINESS

1. Motion to Waive Bids and Approval of the Purchase of Chlorination Equipment from Parkson Corporation in the Amount of **$136,400.00**
2. Approval of a Resolution Approving an Engagement Letter with Chapman and Cutler
3. Approval of a Resolution Approving an Engagement Letter with Speer Financial, Inc.
4. Approval of a Bill List dated October 17, 2016 in the Amount of **$401,825.71**

OLD BUSINESS

VILLAGE PRESIDENT'S REPORT

COMMITTEE REPORTS

TRUSTEES' COMMENTS

ADMINISTRATOR'S REPORT

ATTORNEY'S REPORT

FIRE DISTRICT REPORT

VILLAGE DEPARTMENT REPORTS

1. Finance
2. Community Development
3. Police
4. Public Works
5. Water

ADJOURN

Initials: SB

VILLAGE OF NORTH AURORA
VILLAGE BOARD MEETING MINUTES
OCTOBER, 3, 2016

CALL TO ORDER

Mayor Berman called the meeting to order.

SILENT PRAYER – MEDITATION – PLEDGE OF ALLEGIANCE

ROLL CALL

In attendance: Mayor Dale Berman, Trustee Mark Gaffino, Trustee Mark Carroll, Trustee Chris Faber, Trustee Mike Lowery, Trustee Laura Curtis and Village Clerk Murray. **Not in attendance:** Trustee Mark Guethle.

Staff in attendance: Village Administrator Steve Bosco, Finance Director Bill Hannah, Community & Economic Development Director Mike Toth, Water Superintendent Paul Young, Public Works Superintendent Mike Glock, Police Chief Dave Summer, Fire Marshall Eric Bunkofske, Village Attorney Kevin Drendel.

PRESENTATION

1. **Britta McKenna – Illinois Math and Science Academy (IMSA).**

Britta McKenna, Chief Innovation Officer at IMSA, provided a presentation regarding IN2 at the Illinois Mathematics and Science Academy. IN2 is a state of the art innovation center designed to ignite collaboration and entrepreneurial activity among students, educators, business and the community to solve real-world problems, design prototypes and launch new ideas to advance the human condition.

AUDIENCE COMMENTS - None

TRUSTEE COMMENTS - None

CONSENT AGENDA

1. Approval of Village Board Minutes dated 09/19/2016
2. Approval of a Special Events Permit Application from the North Aurora Fire District for their Annual Turkey Raffle to be held on November 18-19, 2016

Motion for approval made by Trustee Gaffino and seconded by Trustee Carroll. **Roll Call vote:** Trustee Gaffino – yes, Trustee Carroll – yes, Trustee Faber – yes, Trustee Lowery – yes, Trustee Curtis – yes. **Motion approved (5-0)**.

NEW BUSINESS

1. Approval of an Ordinance Amending Chapter 15.48 (Signs) of Title 15 of the North Aurora Code by Adding Section 15.45.115 creating the Auto Mall Special Sign District
Motion for approval made by Trustee Faber and seconded by Trustee Curtis. **Roll Call Vote:** Trustee Faber – yes, Trustee Curtis – yes, Trustee Lowery – yes, Trustee Gaffino – yes, Trustee Carroll – yes. **Motion approved (5-0).**

2. Approval of a Resolution Approving Route 31 T.I.F. Façade Grant Funding for 111 S. Lincolnway, North Aurora
Motion for approval made by Trustee Curtis and seconded by Trustee Lowery. **Roll Call Vote:** Trustee Curtis – yes, Trustee Lowery – yes, Trustee Faber – yes, Trustee Gaffino – yes, Trustee Carroll – yes. **Motion approved (5-0)**.

3. Approval of a Contractual Agreement between Village of North Aurora and Hexagon Safety and Infrastructure for Computer Aided Dispatch (CAD), Field Based Reporting (FBR), and Records Management (RMS)
Motion for approval made by Trustee Lowery and seconded by Trustee Gaffino. **Roll Call Vote**: Trustee Lowery – yes, Trustee Curtis – yes, Trustee Faber – yes, Trustee Gaffino – yes, Trustee Carroll – yes. **Motion approved (5-0)**.

4. Approval of a Bid from Precision Pavement Markings Inc. in the Amount of $9,009.40 for the 2016 MFT Pavement Striping Project
Motion for approval made by Trustee Gaffino and seconded by Trustee Lowery. **Roll Call Vote**: Trustee Gaffino – yes, Trustee Carroll – yes, Trustee Faber – yes, Trustee Curtis – yes, Trustee Lowery –y yes. **Motion approved (5-0)**.

5. Approval of a Bill List dated October 3, 2016 in the Amount of $801,218.94
Motion for approval made by Trustee Lowery and seconded by Trustee Curtis. **Roll Call Vote**: Trustee Lowery – yes, Trustee Curtis – yes, Trustee Faber – yes, Trustee Carroll – yews, Trustee Gaffino – yes. **Motion approved (5-0)**,

OLD BUSINESS - None
VILLAGE PRESIDENT'S REPORT - None
COMMITTEE REPORTS - None
TRUSTEES' COMMENTS - None
ADMINISTRATOR'S REPORT - None
ATTORNEY'S REPORT - None
FIRE DISTRICT REPORT - None

VILLAGE DEPARTMENT REPORTS
1. Finance – Bill Hannah reported that there would be a finance committee meeting next Monday**.** The monthly reports for August went out recently. Sikich will be in attendance at the next Village Board meeting to discuss the financial reporting for the last fiscal year.
2. Community Development – the old gas station on Route 31 is currently being demolished.
3. Police - None
4. Public Works – The Village is working on putting up the new entry signs. This should be finished before the first snow hits.
5. Water - None

ADJOURNMENT
Motion to adjourn made by Trustee Curtis and seconded by Trustee Lowery. All in favor. **Motion approved**.

Respectfully Submitted,

Lori J. Murray
Village Clerk

VILLAGE OF NORTH AURORA
COMMITTEE OF THE WHOLE MEETING MINUTES
OCTOBER 3, 2016

CALL TO ORDER
Mayor Berman called the meeting to order.

ROLL CALL
In attendance: Mayor Dale Berman, Trustee Mark Gaffino, Trustee Mark Carroll, Trustee Chris Faber, Trustee Mike Lowery, Trustee Laura Curtis and Village Clerk Murray. **Not in attendance:** Trustee Mark Guethle.

Staff in attendance: Village Administrator Steve Bosco, Finance Director Bill Hannah, Community & Economic Development Director Mike Toth, Water Superintendent Paul Young, Public Works Superintendent Mike Glock, Police Chief Dave Summer, Fire Marshall Eric Bunkofske, Village Attorney Kevin Drendel.

AUDIENCE COMMENTS – None

TRUSTEE COMMENTS – None

DISCUSSION
1. **Discussion of Shodeen Concept Plan**

The concept plan includes seven (7) multi-family residential buildings which would consist of 261 residential units (stacked flats) and a clubhouse. The units would be 1 and 2 bedroom rental units in a three story high building with underground parking. The plan also includes two restaurant pad sites along Randall Road totaling an estimated 9,100 s.f. This development would be proposed as a PUD.

Shodeen is requesting a 50-foot building height allowance. The Village's standard is 3.5 stories or 45 feet. The Village's front yard setback is at 25 feet. The builder is requesting 10 to 55 feet. The Village's rear yard setback is at 30 feet. The developer is requesting 20 to 85 feet. The Village's interior yard setback is set at a minimum of 10 feet. The developer is requesting 10 to 60 feet.

The developer suggested discussing with the Village that there may be overparking at this development due to the parking requirements of the Village.

Trustee Curtis asked if these 1 and 2 bedroom units would have a minimal effect on the school district. The developer stated that was correct and noted that the average age of the residents who reside in this type of stacked flat product would be 60 years old. The rent would be in the area of $1500/mo. Curtis stated that according to the Comprehensive Plan, this area is suggested for commercial. Curtis suggested it be more of an upscale mixed use development rather than so much residential.

Trustee Lowery asked for the addition of shutters to the façade due to his concerns about the overall aesthetic appeal. Trustee Faber added that the building is not architecturally stimulating. The developer suggested the Board drive to Mill Creek in Geneva to take a look at the similar building in order to get a better perspective.

In terms of façade, Trustee Gaffino agreed with a mixed-use concept up front as suggested by Trustee Curtis. Trustee Carroll was in favor of developing the property and said he would like to see some nicer upscale restaurants rather than fast food. Trustee Faber suggested retail strips such as those on 3rd street in Geneva.

2. **Discussion of Elleby Court Parking Ban**

The Village engineer did a turn radius analysis and determined that a standard fire truck will have difficulty making a turn in the cul-de-sac. However, in an emergency situation, if the fire department needs to go over the median in order to get to a house, they will.

Kristin Stumm, 3056 Elleby Court, North Aurora – Ms. Stumm said she was disappointed that the HOA did not notify the homeowners about their request to ban parking on Elleby Court. Stumm stated that she was not aware of any homeowners who live in the court being concerned with parking and added that they rarely have cars parked in the cul-de-sac.

Greg Sutton, HOA President of Lake Run Estates, 454 Lake Run Court, North Aurora – Sutton stated that the HOA has a responsibility to respond to concerns brought to their attention by the homeowners. The concern is public safety.

After further discussion, the Village Board decided to let this issue be resolved by the residents. The Village does not regulate parking on cul-de-sacs anywhere else in the Village and decided not to do so in this case.

ADJOURN TO EXECUTIVE SESSION

Motion to adjourn to executive session made by Trustee Faber and seconded by Trustee Carroll for the purpose of reviewing the list of executive session minutes to be released. All in favor. **Motion approved (5-0)**.

(return from Executive Session)

ADJOURNMENT

Motion to adjourn made by Trustee Faber and seconded by Trustee Carroll. All in favor. **Motion approved**.

Respectfully Submitted,

Lori J. Murray
Village Clerk

Minutes Dated	Executive Session Minutes Approved for Release	Released
11/10/2008	Land Acquisition; Review of Exec. Session Minutes of Oct. 13, 2008	10/17/2016
11/24/2008 I	Imminent Litigation	10/17/2016
11/24/2008 II	land Acquisition;	10/17/2016
11/24/2008 III	Review of Exec. Session Minutes for Release	10/17/2016
12/8/2008 I	Land Acquisition	10/17/2016
12/8/2008 II	Imminent Litigation	10/17/2016
12/8/2008 III	Review of Release of Exec. Session Minutes,	10/17/2016
12/8/2008 IV	review of 11/24/2008 Exec. Session minutes Session I, II, and III and Dec. 1 2008	10/17/2016
12/7/2009 II	Probable Litigation	10/17/2016
8/16/2010	Probable Litigation	10/17/2016
9/21/2015	Release of Exec Session Minutes	10/17/2016
1/18/2016	Land Acquisition	10/17/2016
3/7/2016	Release of Certain Executive Session Minutes up to and including 1/18/2016	10/17/2016
4/4/2016	Land Acquisition Session 2	10/17/2016

REMPE–SHARPE
& Associates, Inc.

Principals

J. Bibby P.E., S.E.
D. A. Watson P.E.
……
B. Bennett P.E. CFM
G. Ulreich P.E.
L. Vo P.E.
J. Whitt P.E.

CONSULTING ENGINEERS

324 West State Street
Geneva, Illinois 60134
Phone: 630/ 232-0827 – Fax: 630/ 232-1629

MEMORANDUM

DATE: **October 13, 2016** **File:** **NA-577**

TO: **Paul Young** **P.C.** **Mike Glock**

FROM: **D. A. Watson**

SUBJECT: **Chlorination Equipment**
East Water Treatment Plant

The Engineer has received the information in regard to changing out the chlorination equipment at the East Treatment Plant. The existing equipment is experiencing operational problems after 10 years of constant service. One of the three existing units at the East Water Treatment Plant is no longer working and the other two units have been in use for ten years. The existing units are in parallel, meaning that if the controller experiences problems, all three units would be out of service. The supplier does not make these units or replacement parts anymore. The new units are stand alone with separate controls for each unit. The Village Staff wishes to continue generating chlorine on site, rather than going back to the dangers of chlorine gas or ordering liquid sodium hypochlorite.

The attached memorandum dated August 29, 2016 demonstrates that by purchasing two (2) units at 100PPD (pounds per day), the Village will meet the present chlorine demand of 4PPM (parts per million) along with the IEPA's requirement of 5PPM with the two existing wells running along with a future well. There is room for a third redundant unit if required in the future, by changing chlorine demands. But the deep sandstone well water has very consistent water quality, so the Engineer does not anticipate a future increase in chlorine demand. If one of the units goes out during peak demand when all three wells are required, the Village could order and have within a day liquid sodium hypochlorite which could be used until the chlorination unit was back on line.

Finally, the Engineer will solicit proposals form three qualified general contractors to remove the old equipment, install the new equipment including the necessary plumbing and electrical changes, the new units are 120V as opposed to the old unit's 240V service, and all required changes with the SCADA system to monitor and control the units.

The Village Staff and the Engineer recommends directly purchasing two new 100PPD Sodium Hypochlorite units from Parkson Corporation in the amount of $136,400.00. The delivery time is 12 to 14 weeks after shop drawing approval. The Engineer estimates that the installation costs will be around $15K to $25K.

The equipment recommended is the next generation from MIOX, the original equipment supplier. The existing brine feed and storage tanks, the existing water softeners, the existing brine and pressure booster pumps, the existing oxidant storage tanks and injection pumps are all compatible with the new equipment and can be reused. Staff thought that with the long lead time involved after ordering this equipment, going with a known vendor and purchasing the equipment directly would save time and the contractors mark-up on the equipment..

REMPE–SHARPE
& Associates, Inc.

Principals

J. Bibby P.E., S.E.
D. A. Watson P.E.
.....
B. Bennett P.E. CFM
G. Ulreich P.E.
L. Vo P.E.
J. Whitt P.E.

CONSULTING ENGINEERS

324 West State Street
Geneva, Illinois 60134
Phone: 630/ 232-0827 – Fax: 630/ 232-1629

MEMORANDUM

DATE: **August 29, 2016**

File: **NA-577**

TO: **Paul Young**

P.C. **Mike Glock**
Jeremy Barkei

FROM: **D. A. Watson**

SUBJECT: **Chlorination Equipment Revised**
East Treatment Plant

The Engineer has received the information in regard to changing out the chlorination equipment at the East Treatment Plant. Using the following equation:

$$GPM \times 60 \times 24 \times 8.34 \times PPM \times 10^6 = PPD$$

WELLS	GPM	CL @ 5 PPM	CL @ 3 PPM	CL @ 1 PPM
Well No. 5	1,300 GPM	78 PPD	47 PPD	16 PPD
Well No. 7	1,000 GPM	60 PPD	36 PPD	12 PPD
Future Well No. 9	1,000 GPM	60 PPD	36 PPD	12 PPD
TOTAL FLOW	**3,300 GPM**	**198 PPD**	**119 PPD**	**40 PPD**

The Engineer calculated the following chlorination rates using the maximum design pumping rate of 3,300 GPM and the IEPA's requirement of having chlorination equipment capable of feeding 5 PPM. Using the above calculation, the chlorination equipment should be sized to feed **198 PPD** of chlorine.

The treatment plants are currently utilizing 3PPM pre-treatment and 1PPM post treatment, so the 5PPM is not excessive. Total normal maximum daily use 119PPD + 40PPD = **159PPD**

The sodium hypochlorite proposed is a 0.75% solution, maximum pump rate would be:

1 gallon = 8.34 lbs of Solution x .0075 = 0.063 lbs of CI/Gallon

$$\frac{1 \text{ gallon}}{0.063 \text{ lbs}} = \frac{X}{198 \text{ PPD}} = 3{,}140 \text{ Gallons/Day or } 131 \text{ Gallons/HR or } 2.2 \text{ GPM}$$

I spoke with Gerard Zimmer (217-782-1724) at the IEPA in Springfield. Since this is a ground water system, we do not need redundancy in the Chlorination Generating Equipment. That only applies to surface water. We should sit down and review the treatment plant's operation with Jeremy.

MaximOs™

Parkson™
Treating Water Right

On-Site Generated Sodium Hypochlorite Equipment

North Aurora - East Plant, IL

Proposal: P02600601

Monday, September 12, 2016

To:	Paul Young	Date:	Monday, September 12, 2016
Company:	City of North Aurora, IL	From:	Luc La Haie
Tel.:		Tel.:	(873) 200-1408
cc:	Randy Otts, Ron Maiorana & George Argiris		
Subject:	Parkson's MaximOS™ On-site water disinfection technology, Design Proposal for North Aurora - East Plant, IL.		

Dear Mr. Young

Thank you for this opportunity to present our technical proposal for Parkson's MaximOS™ On-site Generated Sodium Hypochlorite Equipment.

Based upon the data provided for this project, we developed the MaximOS™ design described in this technical proposal.

The enclosed proposal details how the MaximOS™ system will achieve these goals. Should you have any questions or need clarifications, please do not hesitate to contact me at (873) 200-1408.

Sincerely,

PARKSON CORPORATION
An Axel Johnson, Inc. Company

Luc La Haie
Product Specialist
llahaie@parkson.com

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4. **Acid Washing Procedure**
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   - **5.2. Water Quality**
   - **5.3. Salt**

1 Introduction

Parkson Corporation

Founded in 1960, Parkson has been a supplier of equipment and solutions for potable water, process water, industrial and municipal wastewater applications for over 50 years. Parkson has built a solid reputation for not only offering a high performance product portfolio, but for standing behind every single product sold to ensure our customers' needs are met. This has allowed Parkson to build long-term, collaborative relationships with consulting engineers, contractors and municipal owners.

With offices spread out across the United States, Parkson's team of certified field technicians are easily dispersed to any of our thousands of Parkson installations spanning the entire country. Parkson does have a 24/7 call center where customer calls are fielded, diagnos ed and properly documented at which point they are sent to our field service manager. The field service manager locates the customer's site and promptly informs the localized certified field technician of the issue. The customer is contacted to let them know we are working to resolve their issue. If parts are required they are ordered and coordinated with the customer as to when the parts will arrive as well as the timing of the certified field technician being on site.

Key Personnel:

Julie Davis
Project Manager

Randy Otts
Product Manager

Ron Maiorana
Regional Sale Manager

Kevin Hoeschen
Field Service
Project Manager

Chinmay Vaze
Product Mechanical Engineer

Luc La Haie
Product Specialist

MIOX Corporation

MIOX Corporation was established in 1994 by scientists from Los Alamos National Laboratory after spending many years working under a US government contract to develop a portable water disinfection unit for use in remote locations. The culture of innovation upon which the company was founded has positioned them as the leader in research and development in the onsite generation market place.

Here are just a few of the many onsite generation features that were pioneered by MIOX:

- Constant voltage/ varying amperage (current) control scheme: The original designers of this control scheme. This is a very important as it provides the most efficient brine and energy efficiency. This is outlined in more detail in the Consistent Performance Measurement section of this proposal. It has been recognized by the industry that constant voltage / varying amperage control scheme is more efficient as similar designs of competitors have appeared on the market.
- In 2008, MIOX released to the market the first commercialized self-cleaning electrolytic cell. This was developed to eliminate the necessity of acid washing the electrolytic cells. Ensuring the cells are proactively cleaned increases the reliability and durability of the generators.
- The MIOX system is the only system that utilizes a third party endorsed hydrogen passive venting system (Hydrogen Safety, LLC). This passive venting system can be operated independently or in combination with a dilution air system.
- Mixed Oxidant Solution: MIOX Corporation continues to lead the industry by developing and commercializing the first mixed oxidant solution (MOS) generator. While free available chlorine (FAC) is the primary analyzable oxidant constituent in a MOS system, the introduction of additional electricity during the electrolysis process generates trace amounts of many other oxidants like chlorine dioxide, hydrogen peroxide and ozone. The additional oxidant species in MOS are responsible for enhanced biocidal efficacy, as well as enhanced behavior in several chemical processes important in water treatment.

By producing innovative products that provide customers with the most value added solutions, MIOX has been able to enjoy robust growth. There are now over 1,500 units operating in hundreds of U.S. sites and over 30 countries worldwide.

MIOX technology operates in a vast array of applications within the municipal, food and beverage, industrial, commercial, and oil industries. In 2011, Parkson partnered with MIOX and became the exclusive provider of MIOX technology in the municipal water and wastewater market space. The resulting product was the Parkson MaximOS™ Onsite Generation System.

2 Partial Installation List

Alton, IL

East Carbon, UT

Marion, IL

Peoria, AZ

Richland UV-WTP, WA

Apple Valley, CA

3 Complete Process Description

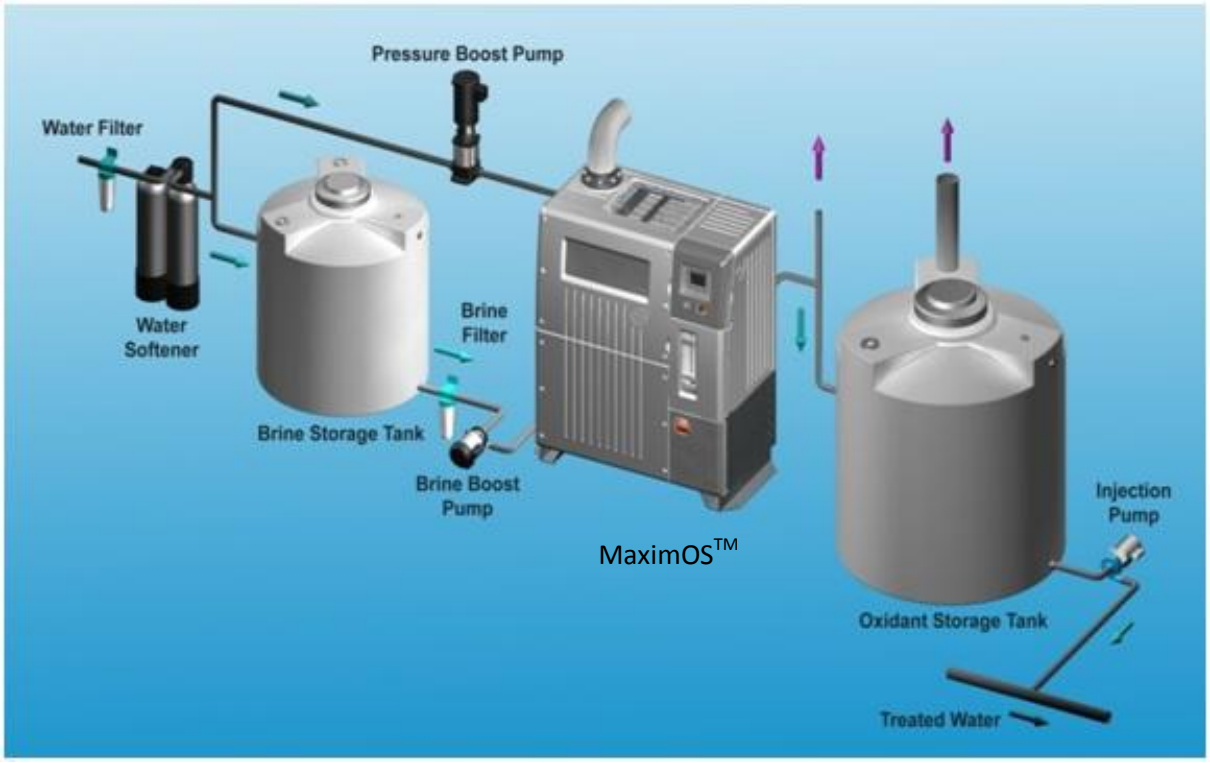


Figure 1

Figure 1 above depicts all components of a typical system except the water heater and water chiller as required for site conditions.

Summary of Design

As Shown on the PID in SECTION 5, the process flow is very simple. The city is to provide feed water connection inside the building where the On-Site Generators (OSG) will be installed. From that feed, the water pre-treatment is separated in two (2) distinctive flow paths. One to feed the On-Site Generators, the other one is to feed the Brine Generation Silo and standby/backup bulk sodium hypochlorite dilution panel. After the pre-treatment, the OSG will produce the oxidant solution and transfer it, using a common header, to the sodium hypochlorite storage tank(s). The system is using a hydrogen passive vent Liquid Barrier System (LBS). From there, an injection system will provide the required dosage based on requirement input from the plant SCADA system.

Process Safety Checks Initiate

Prior to initiate a production cycle, the system will go through a list of internal and external safety checks to ensure it can be operated safely.

- Hydrogen Monitor is ready by the OSG(s) for alarm
- Rupture disk burst sensor
- Power

Getting water to the Brine Generation Tank and OSG units

- Potable water passes through a 5µM cartridge filter to remove particulate matter from water.
- Filtered water enters the water softener that reduces hardness to 17mg/L of calcium carbonate or less and other undesired constituents such as iron and manganese.
- The softened water is then split in two lines:
  - Brine Generation Tank
  - OSG units:
    - Softened water enters the Pressure Boost System (if required) in order to provide adequate water pressure at each OSG.
    - The Hardness Monitor System (if installed) samples the softened water and will send an alarm signal to the OSG units if hardness is over 20 mg/L.

Getting brine to OSG(s)

- Brine solution exits the brine generator and enters the 5µM brine filter(s) to remove particulate matter from brine.
- Filtered brine is supplied to the water softening system which is used during regeneration cycles.
- Filtered brine enters the brine pressure boost system (if required) in order transfer brine to the OSG brine inlet.

Generating the Disinfection Solution

- Brine and Water will be combined and mixed to the appropriate % prior to entering the electrolytic cell.
- Once inside the electrolytic cell, solution will be converted to Sodium Hypochlorite using electrical power.
- See SECTION 4 for more details on the On-Site Generator and its functionalities.

Sending Oxidant to Storage Tank & Hydrogen Vent System

- Once generated, the solution and hydrogen gas exit the OSG unit(s) into the common transfer line manifold. This is very important in the safety of any hydrogen venting system. This allows for quick detection and repair in case of a leak. If the hydrogen gas and the hypochlorite are separated into two separate lines at the OSG, early indications of a hydrogen leak are not available and Payson will only become aware of the leak when the hydrogen detector goes off. Additionally, the location of the leak at high elevation above finished floor is more difficult due to the separation of the hydrogen gas and liquid.
- The mix enters the hydrogen vent liquid barrier system (LBS). This will separate the hydrogen gas being generated from the solution and vent it through the main vent installed just prior to the tank inlet connection.
- The solution will continue its voyage all the way down the tank internal drop-tube assembly and out into the storage tank.

Hydrogen Vent System description

General Hydrogen Facts

Hydrogen has flammability limits which are considerably wider than for most other flammable gasses. The lower explosive limit (LEL) of hydrogen is 4.1% by volume in air. A concentration of hydrogen in air less than 4.1% will not be explosive because it is too "lean" in fuel. Likewise, the upper explosive limit (UEL) of hydrogen is 74.2% by volume in air. Therefore a mixture of air containing greater than 74.2% hydrogen will not be explosive, it is too "rich" in fuel. The energy to ignite hydrogen in air is also very low at .017 mJ.

Hydrogen gas (H2) is the lightest of the gases with a vapor density of 0.069 (relative to that of air taken to be 1.0), and smallest in molecular size, making hydrogen gas difficult to contain. As such, hydrogen gas will tend to rise rapidly in a normal room atmosphere, seek the highest point in a room or container, and tend to diffuse through most materials of building construction.

For an electrolytic cell, the calculated hydrogen generation rate is 6.96 milliliter per amp-minute for each active anode electrode at standard temperature (0 ^{o}C) and pressure (1 atmosphere pressure).

Liquid Barrier Hydrogen Vent System

The Liquid Barrier Hydrogen Vent (LBS) system **(Figure 2)** uses a gas trap system to prevent hydrogen gas produced during the electrolysis process from entering the oxidant storage tank. Each oxidant tank is equipped with a drop tube in the oxidant tank that hydraulically locks the oxidant solution similar to a "P-trap" system in household plumbing. The hydraulic lock creates a liquid barrier preventing hydrogen gas from entering the oxidant storage tank.

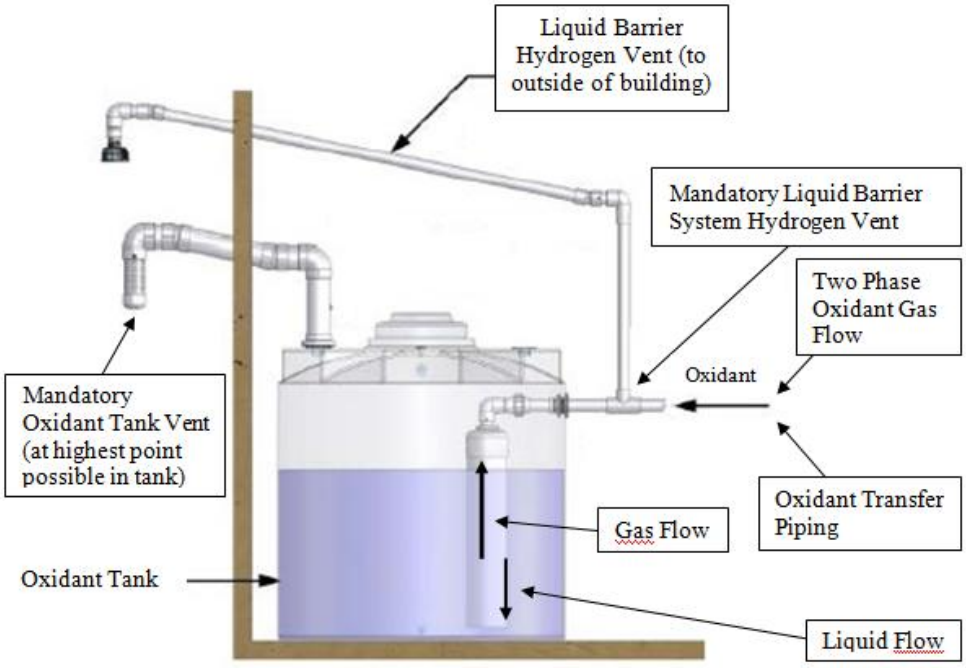


Figure 2

The materials of construction for Oxidant Tank Vent and the Liquid Barrier Hydrogen Vent must be CPVC piping as specified by Parkson, and they should be run at least 12" clear of any heat or electrical sources, such as overhead lights or control boxes. No metal piping material may be used for these vents.

The generally accepted limit for hydrogen accumulation is 25% of the LEL, or 1% hydrogen by volume. These limits are easily maintained with the Liquid Barrier Hydrogen Vent System, and have been validated through rigorous testing.

Figure 3 below shows testing results of the Liquid Barrier System over time and the final results show that Parkson's Liquid Barrier System was less than 2.4% of the 4.1% Hydrogen LEL.

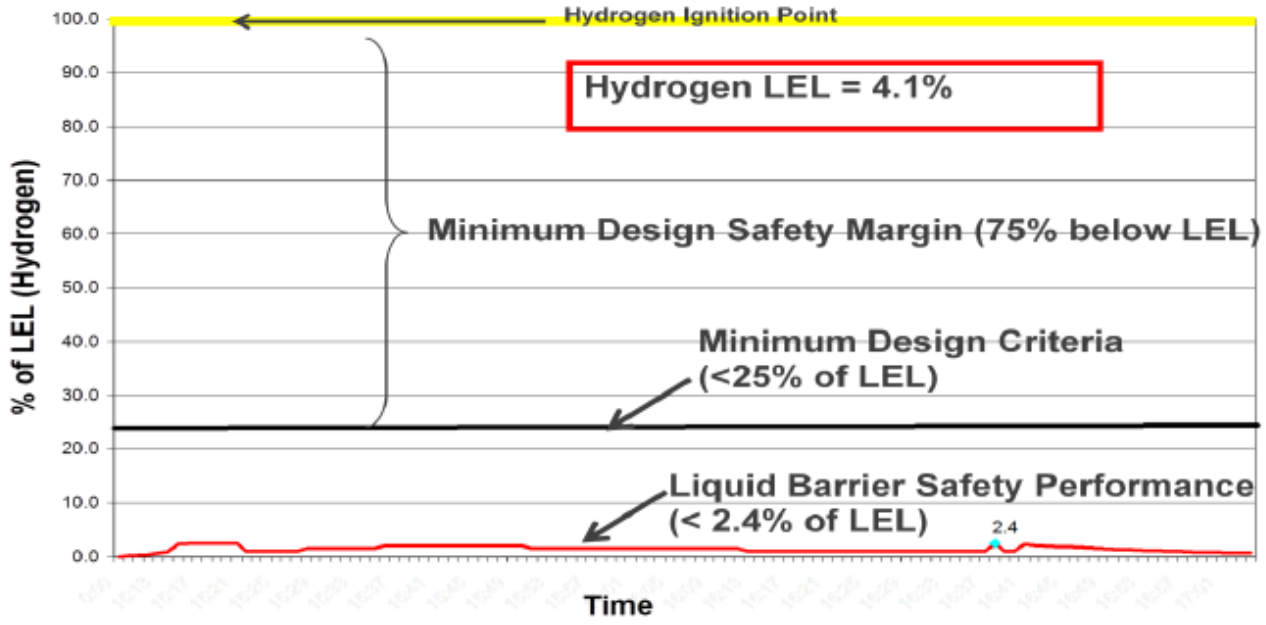


Figure 3

Table 1 below is a short list of MaximOS installations of varying capacity that have been successfully operating for years with the passive hydrogen venting system. A more extensive list can be provided on request:

Year	State	City	Location	Model Number	QTY	Unit Capacity	Total Capacity
2016	AB	Bonanza	Saddle Hills WTP	SM-15	2	30	30
	CO	Roxborough	WTP	SCH-50	2	50	100
	IL	Batavia	WTP	MH-200	2	200	400
	KY	Carrolton	WTP	SCH-50	1	50	50
	MO	Fredericktown	WTP	SM-30	2	30	60
	VI	St. Thomas	Booster Station	SM-60	1	60	60
2015	AZ	Sedona	WWTP	SM-45	1	45	45
	CA	Apple Valley	Well 34	SM-30	1	30	30
	CO	Towaoc	WTP	SM-15	1	15	15
	IL	Millstone	WTP	MM-120	1	120	120
	NE	Beatrice	WTP	SM-60	1	60	60
	UT	Ferron	WTP	SM-30	1	30	30
	UT	East Carbon City	WTP	SM-30	1	30	30
	WA	Parkland	WTP	SCH-100	2	100	200
	WA	Richland	WTP	MH-300-SC	3	300	900
	WA	Richland	WWTP	MH-300-SC	3	300	900
	WA	Richland	UV-WTP	SCH-100	2	100	200
2014	AK	Fairbanks	Fairbanks	SM-30	1	30	30
	AZ	Peoria	Well	SM-15	1	15	15
	CA	Apple Valley	Well 18	SM-15	1	15	15
	CA	Apple Valley	Well 9	SM-15	1	15	15
	IL	Jonesboro	WTP	MM-240	1	240	240
	IN	Huntinburg	WTP	SM-60	1	60	60
	KY	Prestonsburg	SWTP	MM-300	1	300	300
	MO	Patterson	Eagle Sky Camp	SM-45	1	45	45
	SC	Cheraw	WWTP	MM-120	1	120	120
		San Marcos	San Marcos	SM-30	1	30	30
2013	TN	Jonesborough	WTP	MM-240	1	240	240
		Spring City	WTP	SM-60	1	60	60
	WA	Pullman	Well #5	SCH-75	1	75	75
2011	IL	Jonesboro	WTP	MM-240	1	240	240
		Marion	Lake Egypt Water Plant	SM-60	2	60	120
	SC	Cheraw	South WTP	MM-120	1	120	120
2010	SC	Cheraw	WWTP	MM-120	1	120	120
	SC	Dorchester	Bacons Ridge	MM-120	1	120	120
	SC	Dorchester	Orangeburg	MM-60	1	60	60
	SC	Lancaster	Catawba River WTP	MH-300	2	300	600
	SC	West Colombia	Riverside WTP	MIOX-5002	2	500	1,000
	TN	Newport	Cedar Street Plant	MM-180	1	180	180
2009	TN	Newport	Cedar Street Plant	MM-120	1	120	120
2006	SC	Anderson	Hartwell-Anderson SWTP	MIOX-5003	3	500	1,500
2005	SC	West Colombia	Lake Murray WTP	MIOX-5004	4	500	2,000
2004	KY	Prestonsburg	SWTP	MIOX-500N	2	1,000	1,000
2002	KY	Danville	Lake Herrington SWTP	MIOX-1004	8	100	800

Table 1

4 On-Site Generator Design

Electrolytic Cells

The MaximOS™ electrolytic cell has only 1 connection for the inlet and 1 connection for the outlet as shown in **Figure 4**. Some competitor designs could have as many as 10 to 30 connections and intermediate support brackets between electrolytic cells which are areas of potential leaking, collection of calcium carbonate and tedious task to remove and reinstall all the fittings.

The MaximOS™ electrolytic cells are housed in a bolted CPVC enclosure. This is a superior material compared to acrylic that has been prone to crack and leak due to the thermal expansion and contraction an electrolytic cell experiences throughout its cycling.

Figure 4

Additionally, the MaximOS™ electrolytic cells are designed for minimum cell dead volume. Excess space in the cell provides space for hydrogen gas to accumulate. By keeping the available gas volume to a minimum, the risk of creating an explosive condition is minimized. **Figure 5** shows the relative gas volumes available in the MaximOS™ cells.

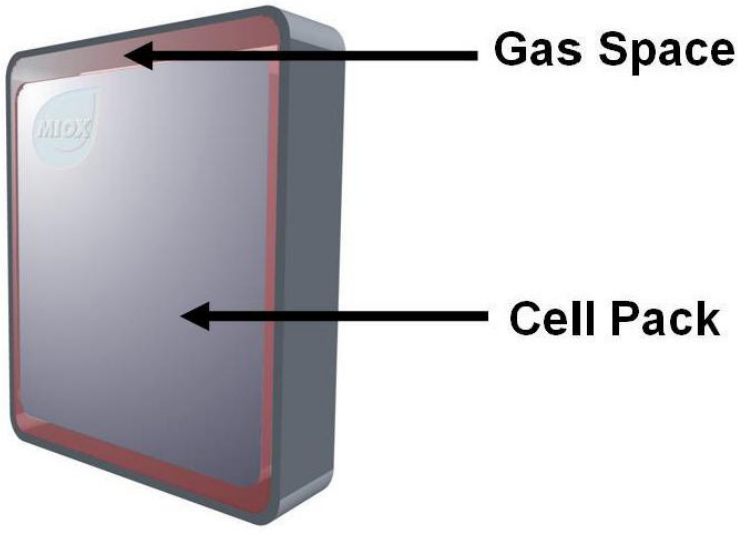


Figure 5

All MaximOS™ cells are designed for low rupture pressure. The cells are typically operated at 7 to 15 psi or less and each cell is leak tested to 25 psi. By keeping the rupture pressure of the cell relatively low, less pressure can develop before a cell breach occurs. To ensure a low pressure system, a rupture disk is located on the cell inlet. When cell pressure exceeds 28 psi the rupture disk will fail and the system will fault. This failure provides a release path for built up pressure in the cell, greatly decreasing the severity of an overpressure in the cell and the hydrogen is removed from the cell and oxidant storage tank through vents.

MaximOS™ Cell Design

MIOX discontinued a pure vertical cell design in 2005 due to high warranty expenses.

Since the redesign, MaximOS™ has gone from over 10% to less than 1% in warranty costs. The main challenge with the previous design was with high aspect ratios. (H/W) when H is >4-5", the electrodes in these cells fail prematurely. We have learned that beyond 4-5", very little electrolysis occurs due to gas generation, concentrating current density to bottom of cell. Our cell design is more efficient than before and lasts longer.

We use CPVC for our cell housing. Acrylic is not as chemically resistant to oxidants as CPVC, and leaching of plasticizers is not an issue with CPVC.

Our cells are building blocks that can be ganged together to increase capacity in the same footprint (up to 100 ppd). And with our configuration of the cells in the cabinet, the number of inlet and discharge point from the cell block is one each. This is a tremendous advantage from the standpoint of piping simplicity as well as ease of maintenance.

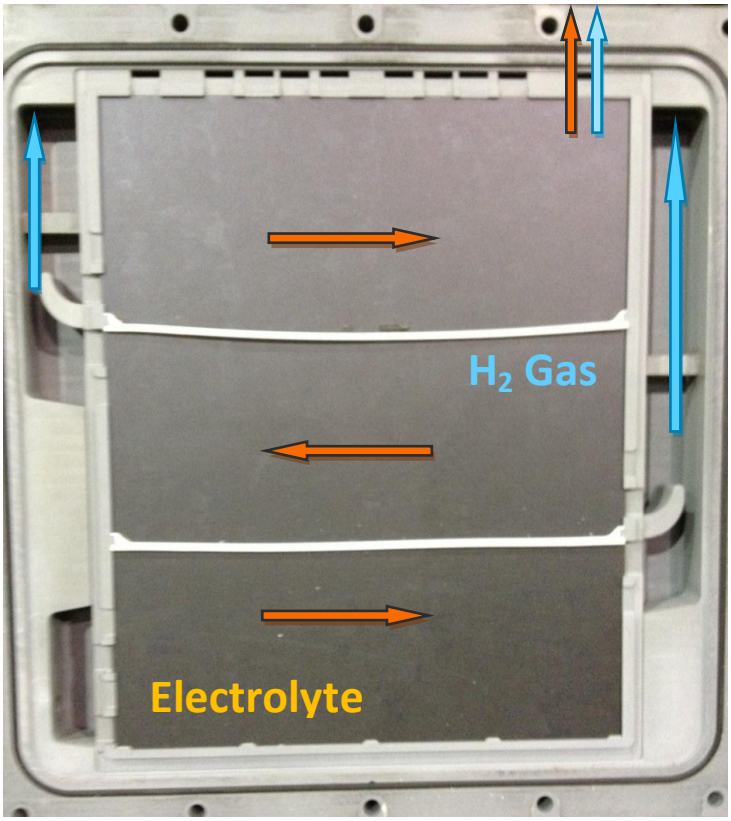


Figure 6

The MaximOS™ cell is designed so that hydrogen and the hypochlorite solution are re-combined together when leaving the cell. As shown in **Figure 6**. This is done for two safety reasons. First, if there was a leak in the line and it was just hydrogen gas, the only way you would know there is a leak is when the hydrogen detector sends an alarm signal. It would be difficult to find the leak as well. If the hydrogen and the hypochlorite are together and there is a leak, the operator would see the leak from the line. Secondly, the hypochlorite in the line is surrounding the hydrogen gas bubbles so it is almost impossible for it to ignite in the line versus if it was just hydrogen by itself. Furthermore, we avoid any potential re-rating of the equipment room that may need to be considered if a hydrogen gas only line is in the room. MaximOS™ also provides a passive venting system that has no mechanical parts and will offer redundant safety to an installed blower system.

MaximOS™ does not simply monitor a high temperature in the product to alert of a potential system issue. If the incoming water is coming in at 65 degrees, the normal temperature increase should only be 35 to 40 degrees. The MaximOS™ unit will alarm for any incoming water to outgoing product temperature differential in excess of 40 degrees.

MaximOS™ monitors the condition of the cell by current variance across the cell, brine pump voltage, and temperature differential without relying on the visual inspection through the acrylic cell. Additionally, the unit can be programmed to operate during off peak hours via the on-board HMI.

Generator Housing

To protect operators from a pressure event that may occur within the cell, the Small Series systems are housed in a rotational-molded, double-walled, linear polyethylene close-out panels, as shown in **Figure 7**. The cell is positioned on a rotational-molded tray that provides downward impact resistance due to the material flexibility. The panels are configured to be hollow with 1/8 inch thick wall sections that are spaced variously (wall to wall spacing) up to 3.00 inches providing flexibility and overpressure expansion allowance to contain any loose components that may be ejected from a ruptured cell. The panels not only provide double wall flexible impact resistance, but the windows in the cell compartment are polycarbonate (Lexan) to provide additional flexibility and safety, and are adhesive bonded to the inner window frame section. To verify the integrity of this design concept, the system was rigorously safety tested.

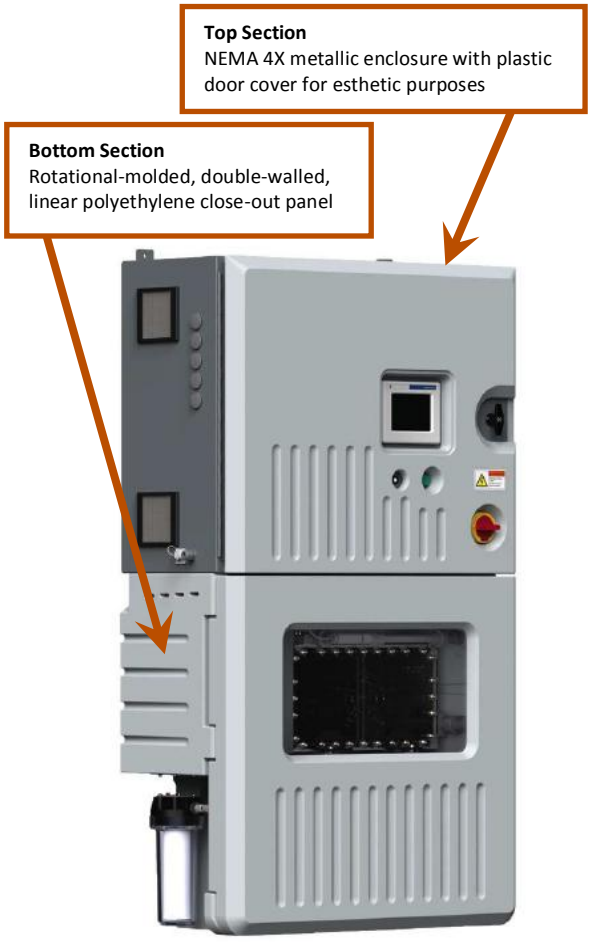
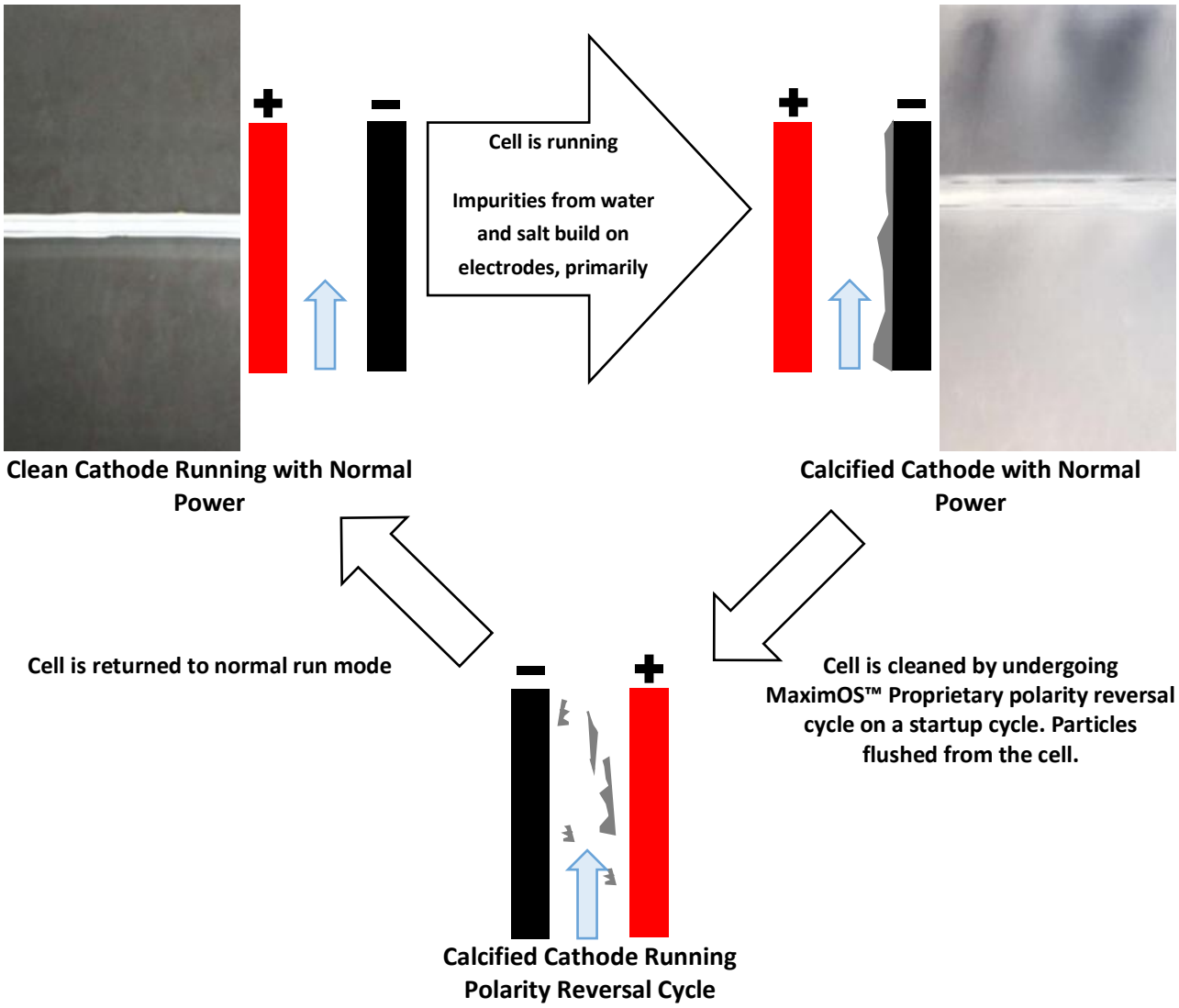


Figure 7

Self-Cleaning System

MaximOS provides the flexibility of self-cleaning electrolytic cell technology on the Mixed Oxidant systems as a standard feature, and as an optional feature on the Sodium Hypochlorite systems. This technology has been around since 2008 with one of the first systems installed in Colville, WA and the original cell is still in operation. This offers additional ease of use to plant staff as well as providing a cleaning cycle every 720 hours without the need of muriatic acid and which high velocity flow will not accomplish. With the successful reversal of polarity, all the active area of the electrolytic cell is cleaned of calcium carbonate deposits ensuring that power and salt efficiencies are always at optimum levels. This technology further minimizes operator interface and removes the subjectivity of determining if the cell needs to be cleaned or not.

Self-Cleaning System and how it works



MaximOS™ is the only OSG that offers this self-cleaning technology

Self-Cleaning System vs Acid Cleaning

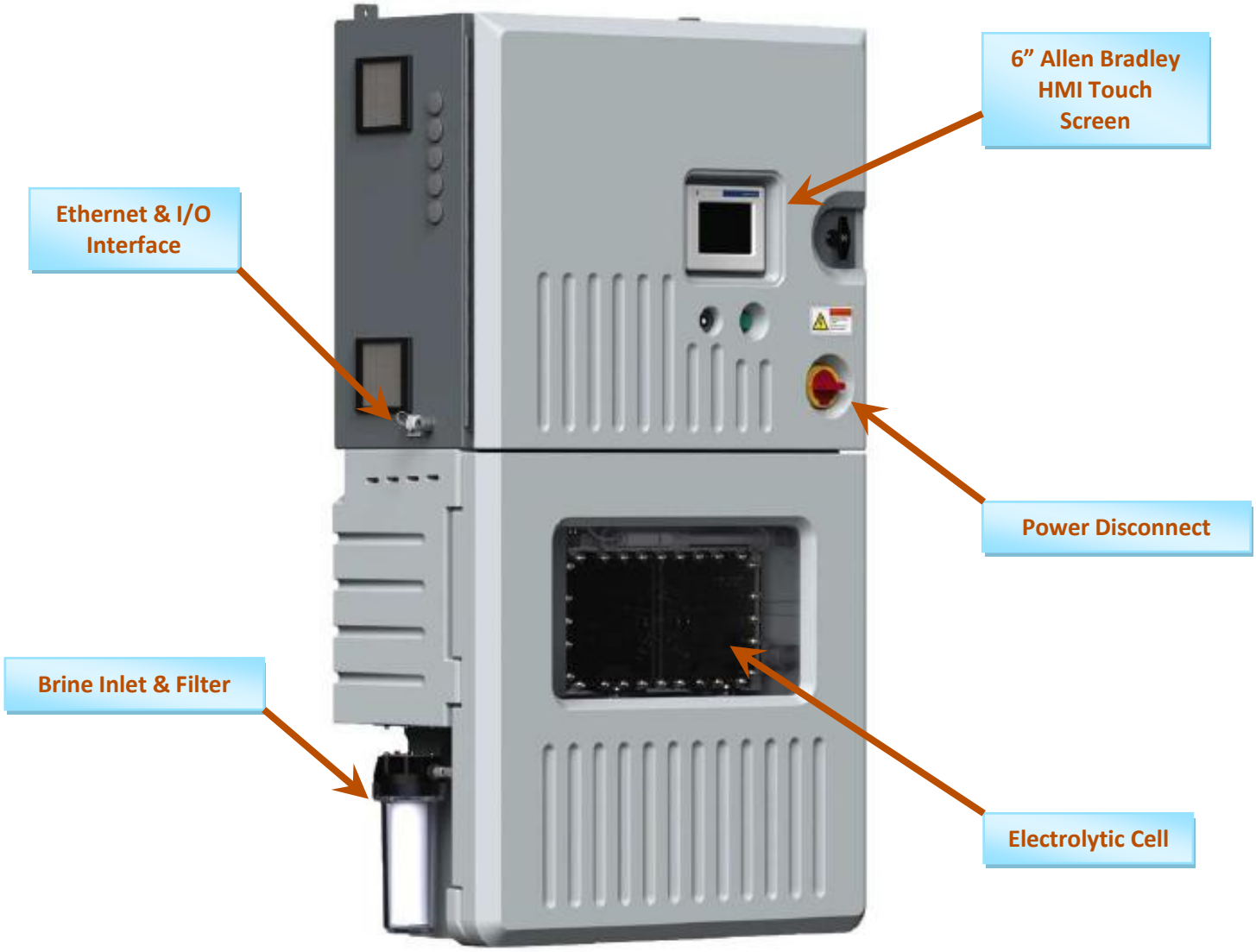
Self-Cleaning

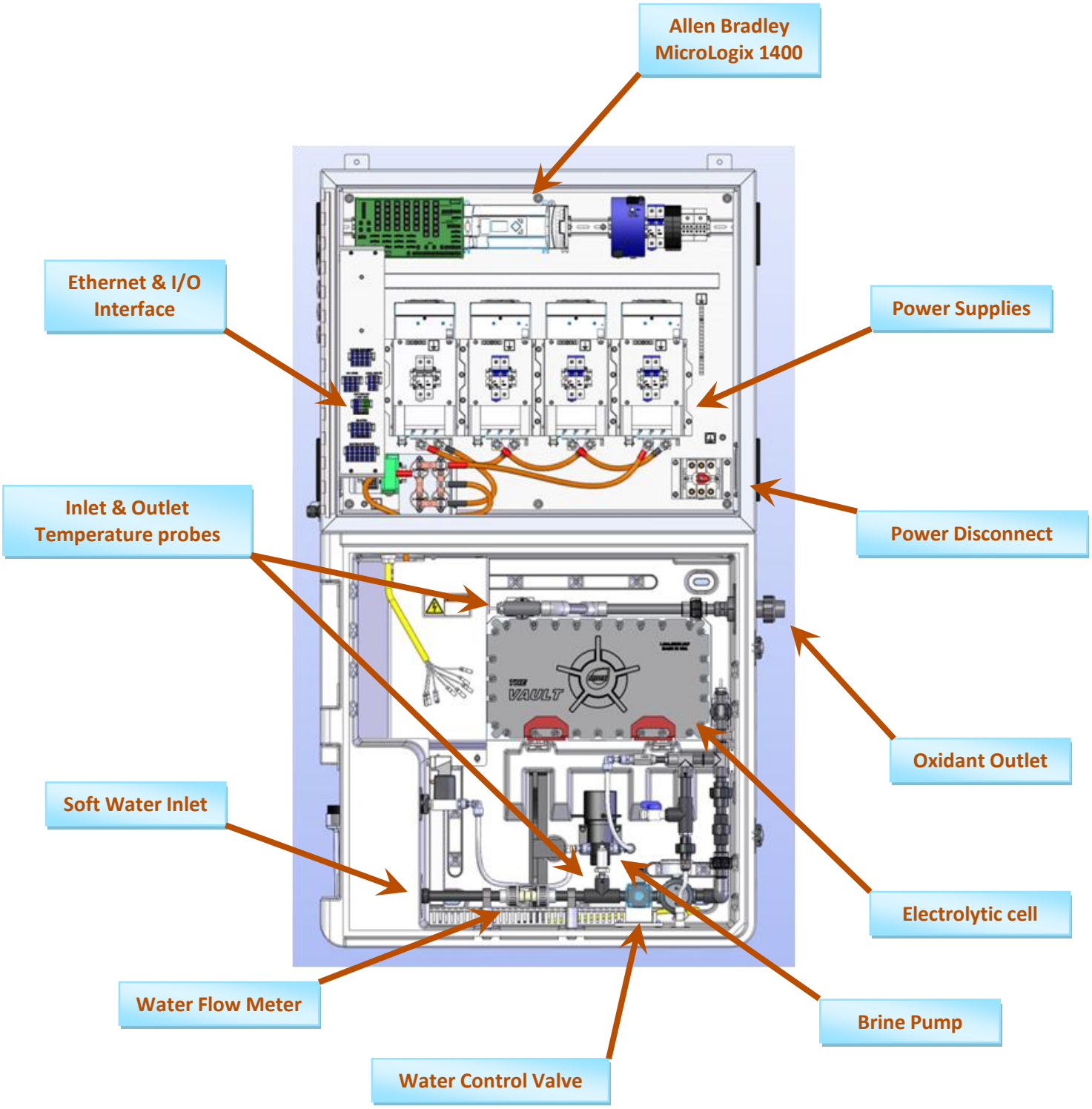
- Automatically occurs every 720 hours
- Duration is approximately 5 minutes per cell
- Electrodes can be uniformly cleaned without the need for muriatic acid
- Minimal particles accumulate in cell with proper flushing
- Automatic proactive maintenance program ensures the most consistent salt and energy efficiencies without regular operator interaction

Acid Cleaning

- Make the necessary observation and initiate OM task activity
- PPE and safety review
- Take the unit off line
- Mix muriatic acid and water
- Recirculation, flush, repeat if required
- Unit is offline minimum of 2-4 hours
- Acid waste disposal

MaximOS Small Series Open Cabinet Overview




Allen Bradley MicroLogix 1400
Ethernet & I/O Interface
Power Supplies
Inlet & Outlet Temperature probes
Power Disconnect
Oxidant Outlet
Soft Water Inlet
Electrolytic cell
Water Flow Meter
Brine Pump
Water Control Valve

OSG Alternator Box

Sequence of Operations

Rev 3

The main purpose of the OSG Alternator is to alternate the operation of two OSG generators in order to maintain equal operating times between the two units. It also allows for the operation of both units in case of a high output demand. The alternator operates with a programmable liquid level controller which has to be programmed to output three different set-point levels within the holding tank, a low-low level Alarm, a low level, high level and Hi-Hi Level Alarm.

1. Level Descriptions

- **Low-Low Level** – the level in the tank at which once reached during normal operation or detected at startup will operate both OSG generators.
- **Low Level** – the level in the tank at which once reached from a declining high level will activate a single OSG generator or if detected at startup will activate one OSG generator.
- **High Level** – the level in the tank that once reached will shut one or both OSG generators in the off or in standby modes.
- **High-High Level** – the level in the tank that once reached will ensure that all OSG generators or shutdown and will send an alarm out to plant SCADA for Hi-Hi Level.

2. OSG Alternator Sequence of Operations

2.1.Upon power-up:

- OSG generator #1 will always be considered the master and generator #2 the backup.
- If the level in the tank is at a low level than OSG generator #1 will be issued a command to start and the “ON” indicator for generator #1 will be on continuously.
- Once the level in the tank reaches a high level than the alternator will issue a command to place OSG generator #1 in off or standby mode, the “ON” indicator will be turned off and OSG generator #2 will be made the master and generator #1 the backup.
- When the level in the tank reaches the low level point again, OSG generator #2 will then be issued a start command, its “ON” indicator will be on continuously and it will continue to run until the high level is reached in the tank.

- At that point generator #2 is placed in the off or standby mode, its indicator will turn off and OSG generator #1 becomes the master and generator #2 the backup again.
- The process between the two generators than continues to repeat itself as the levels in the tank vary between the high and low level set-points.

2.2. If a Low-Low level is detected after one generator is already running:

- The generator already running (let's assume #1 for this example) will keep running. Its "ON" indicator will be on continuously. This generator will continue to run until the high level is reached in the tank.
- The backup generator (generator #2 in this example) will be issued a start command, its "ON" indicator will be flashing continuously and it will continue to run until the high level is reached in the tank.
- At that point generator #2 is placed in the off or standby mode, its indicator will turn off and OSG generator #2 becomes the master and generator #1 the backup.
- The process between the two generators than continues to repeat itself as the levels in the tank vary between the high and low level set-points.

5 Equipment Description

QTY	Item(s) Description	
2	On-Site Generator(s) - Standard model – 0.8%	
	▪ Model:	– SH-100
	▪ Vertical Aluminum Stand	– YES
	▪ Self-Cleaning Sodium Hypochlorite Generator	– NO
	▪ Generator Capacity:	– 100 Lbs/d FAC each
	▪ Salt consumption:	– 3 Lbs salts/Lbs FAC produced
	▪ Energy consumption:	– 2 kW-hr/Lb FAC produced
	▪ FAC concentration:	– 8,000 mg/L ±500 mg/L
	▪ Feed water temperature requirement:	– 50F to 80F
	▪ Feed water pressure requirement:	– 25 psi to 100 psi
	▪ Ambient air temperature requirement:	– 45F to 110F
	▪ Internal vent energy added:	– 2.8 kW
	▪ Electrical Power Requirement:	– 208-240VAC, 1ph, 60 Hz each
	▪ Amp service rating:	– 120 Amps each
	▪ Nominal operating amps:	– 52 Amps each
	▪ Nominal energy to unit:	– 12 kVA each
	▪ OSG Dimensions (W x D x H):	– 36" x 17.4" x 65.5"
	▪ Weight:	– 510 Lbs

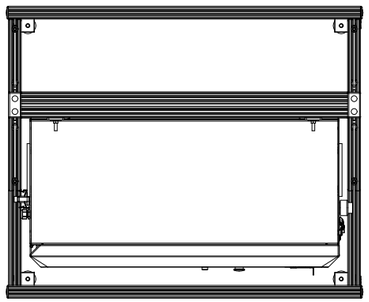
QTY	Item(s) Description
2	On-Site Generator integral controls
Each unit is equipped with an Allen Bradley MicroLogix 1400 PLC with 6" Panelview Plus colored touch screen. The fully automated Allen Bradley control system takes care of all normal operation automatically without the need for direct operator interface. Self-diagnostic capabilities allow the operator to monitor performance and predicatively maintain the system.	
1	Alternator Controller Box
One (1) NEMA 4X Alternator Controller Box – Will automatically alternate in between units – Will automatically startup standby unit when Low-Low is reached – Will also serve as a junction box for wiring existing equipment: ○ Water Boost pump controller ○ Brine Boost pump controller ○ H2 monitor	
2	Brine Tank Float Assembly
– Mechanical, piston-type float valve – Required PVC accessories to install the float valve inside each brine tanks	
1	Spare Parts
– One (1) Brine dilution pump Assembly – Six (6) pleated 5 micron water filter cartridges – Six (6) pleated 5 micron brine filter cartridges – One (1) Flow Sensor	– Two (2) PVDF Adaptors – Five (5) Teflon Rupture Disks – One (1) Pressure regulating valve – One (1) Lot(s) of assorted fuses

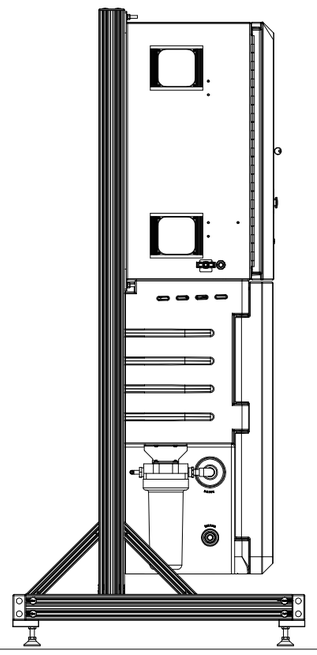
MaximOS™ System Equipment Notes

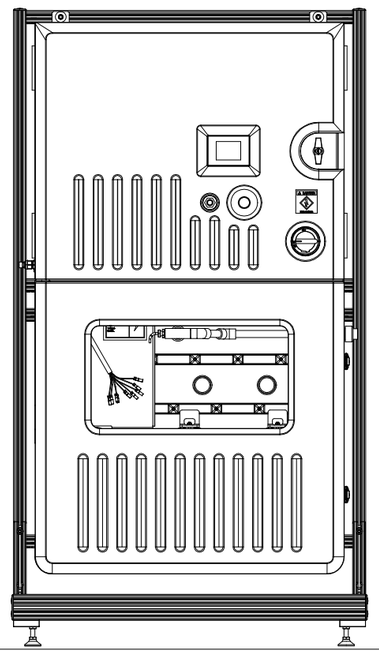
1. The system is designed to handle the 100 lbs/day requirement.
2. The MaximOS™ system produces a Sodium Hypochlorite solution of less than 1% and is not classified as a hazardous material.
3. Although MaximOS™ can use any quality of salt, in order to maintain the (5) years cell warranty we require using high quality salt to prevent calcium and other matter buildup on the cells (which causes acid washing maintenance.)
4. The only liquid waste stream is from the periodic regeneration / backwash of the water softener.
5. Also refer to Specification Sheets.

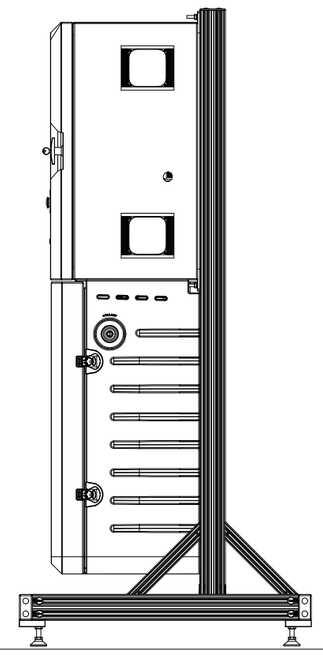
NOTE:

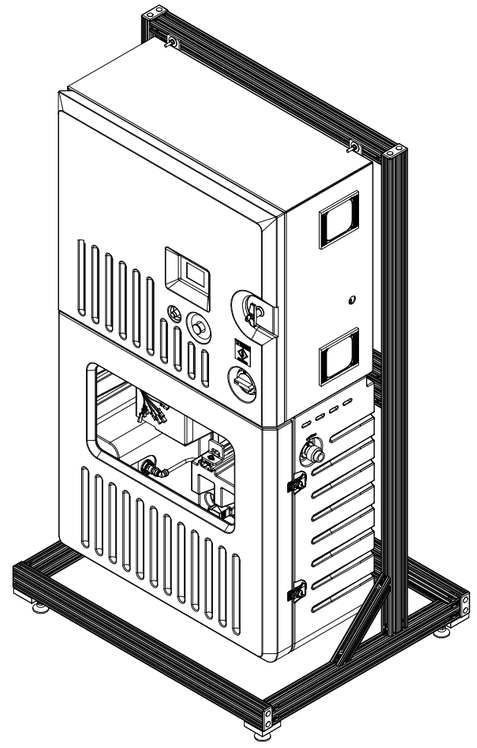
1. REMOVE ALL BURRS AND SHARP EDGES; ROUND ALL CORNERS.
2. REMOVE ALL WELD SPATTER, SLAG AND DISCOLORATION.
3. MATERIAL: 80/20











REV	DESCRIPTION	DATE	BY

X PRELIMINARY ___APPROVAL

X INFORMATION ___CERTIFIED

THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.

DRAWN BY	DATE
LL	03/25/15
CHECKED BY	DATE
SCALE	SIZE
NTS	B

Parkson™

PROJECT NAME: Information Only

TITLE: MaximOS Small Series Vertical® Stand™

REFERENCE INFORMATION: REFERENCE INFORMATION

DRAWING NO: Preliminary

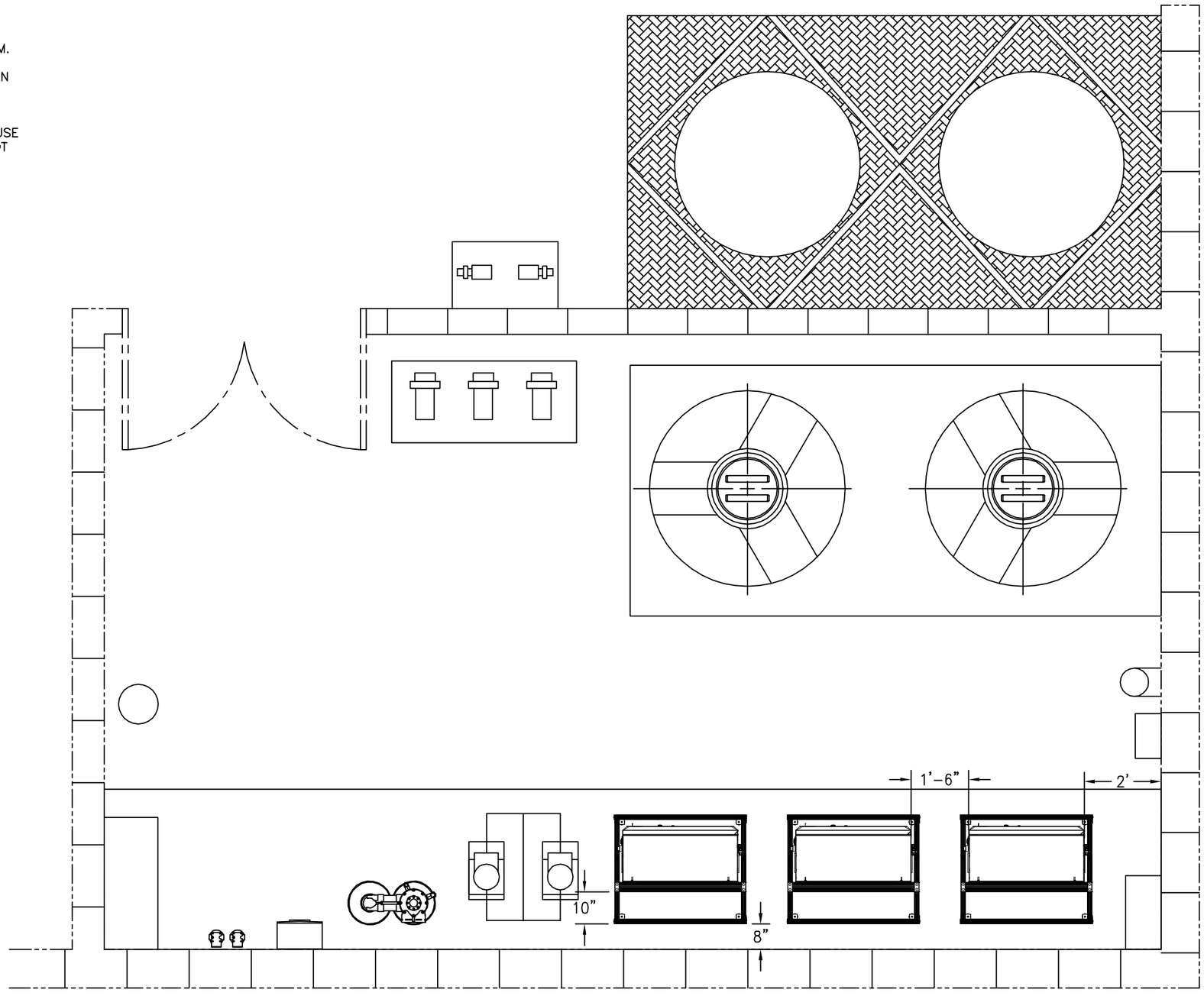
SHEET 1 OF 1

REV: —

NOTES:

1. REPRESENTATIVE DRAWING ONLY. EQUIPMENT SHOWN IS BASIC FOR A FUNCTIONING SYSTEM. ADDITIONAL EQUIPMENT MAY BE REQUIRED DEPENDING ON SPECIFIC ON–SITE GENERATION EQUIPMENT.

2. THIS ROOM LAYOUT IS FOR INFORMATIONAL USE ONLY. FINAL INSTALLATION DRAWINGS ARE NOT PROVIDED BY PARKSON CORP.



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DRAWN BY	DATE
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CHECKED BY	DATE
SCALE	SIZE
NTS	B

Parkson™

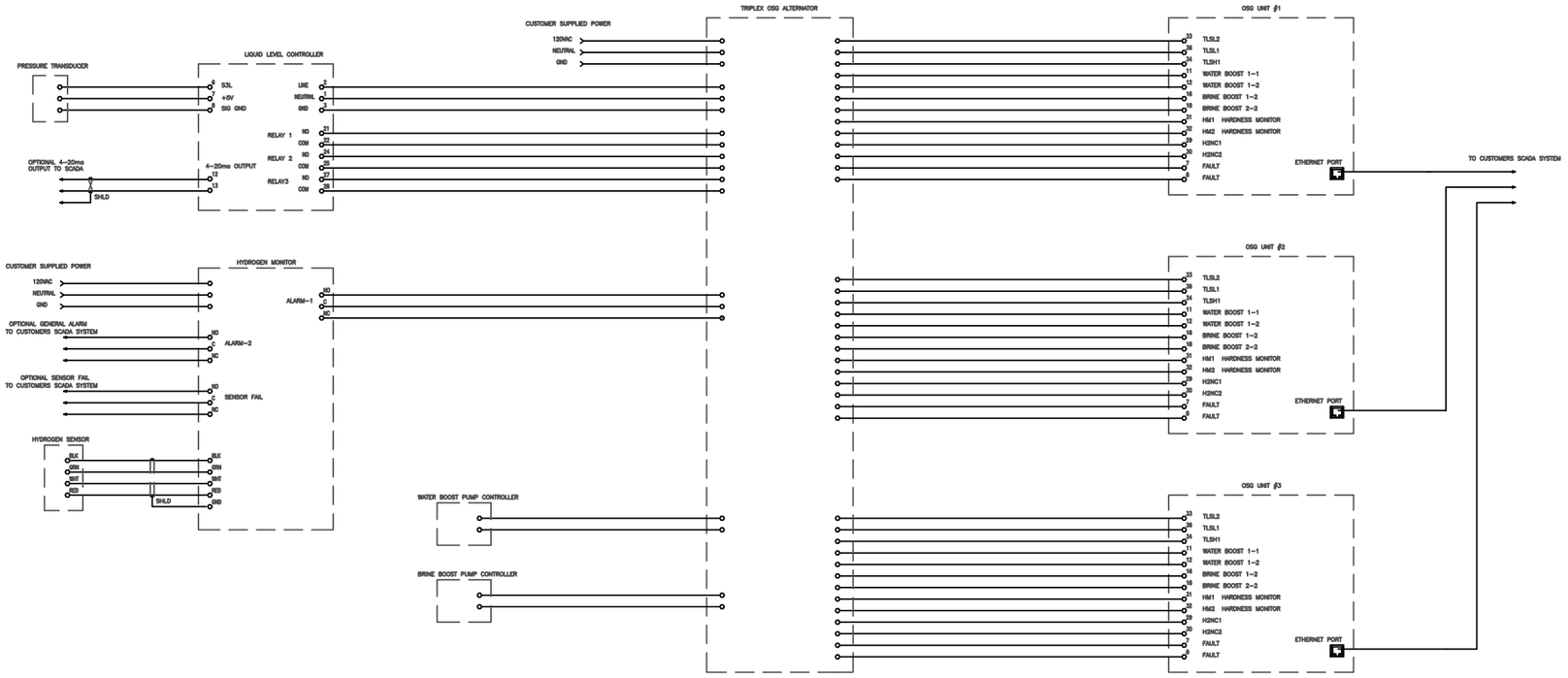
PROJECT NAME
P02600XXX
NORTH AURORA
IL
EAST PLANT

REFERENCE INFORMATION

TITLE
MAXIMOS SERIES ON–SITE GENERATOR
GENERATOR LAYOUT
EXISTING INSTALLATION

DRAWING NO
P02600XXX50
SHEET 1 OF 1

REV
—



REV	DESCRIPTION	DATE	BY

PRELIMINARY APPROVAL

X INFORMATION CERTIFIED

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DRAWN BY	DATE
JWT	9/6/16
CHECKED BY	DATE
SCALE	SIZE
	B

PROJECT NAME

REFERENCE INFORMATION

TITLE

ISOLATED 3 OSG ALTERNATOR CTRL PANEL INTERCONNECT WIRING DIAGRAM

DRAWING NO

SHEET 1 OF 1

REV 2

6 Services

Drawings and Installation, Operation and Maintenance

Approval Drawings:	One (1) electronic included.
Certified Drawings:	One (1) electronic included.
IO&M Manuals:	Three (3) included.

Additional manuals are available for $75 USD at time of order.

Start-up Assistance

Parkson will furnish one factory representative for 2 days during 1 trip to assist in installation inspection, start-up supervision, and operator training. Dates of service to be scheduled upon Buyer's written request.

Mechanical Warranty

Parkson Standard Conditions of Sale, as stated on the attached, shall apply except that the warranty period is replaced with the following:

a. On-site generator enclosure for the period of two (2) years from the date of original manufacture.
b. Electrolytic cell for the period of five (5) years from the date of original manufacture.
c. All other items specified on the face hereof for one year from shipment confirmation from Parkson.

Warranty is based on use of recommended salt quality/specification.

7 Purchase Price

All of the above for …… **$136,400**

USD F.O.B. Point of Manufacture, freight included, taxes excluded.

Validity

Purchase Price is valid for thirty (30) calendar days from Quotation date, for shipment of Equipment within the timetable stated below.

Payment Terms

90% net 30, 10% upon startup, not to exceed 180 days after shipment

Timetable Guideline

Within ten (10) business days of receiving a written Purchase Order in Parkson's office, if necessary, Parkson will submit a written Request for Additional Information requesting items including, but not limited to, full-scale drawings, specification sections, amendments and other documents necessary for Parkson to begin work on this Project. No work can be done on this Project until all Additional Information is received by Parkson, thus beginning the Submittal Phase. If you do not receive such a Request for Additional Information within the stated ten (10) business days, then the Submittal Phase will begin on the eleventh (11th) business day following receipt of the written Purchase Order in Parkson's office. The Shipment Phase is thereafter contingent upon your final approval of all submitted Approval Drawings. Once said final approval is received in Parkson's offices, the Shipment Phase will begin.

Submittal Phase: Approval drawings will be submitted 2-4 weeks from receipt of all requested Additional Information if necessary, or if not necessary, from the eleventh (11th) business day following receipt of a written Purchase Order in Parkson's office.

Shipment Phase: 12-14 weeks following receipt of final approval of all submitted Approval Drawings in Parkson's office.

If the Submittal Phase is waived, the Shipment Phase will begin on receipt of all requested Additional Information if necessary, or if not necessary, on the eleventh (11th) business day following receipt of a written Purchase Order in Parkson's offices.

Dates are subject to confirmation upon receipt of written Purchase Order.

Terms and Conditions

Parkson's Standard Conditions of Sale, as stated on the attached, shall apply, except for warranty as noted above.

8 Patents

The Equipment and/or process quoted herein may operate under one or more U.S. patents. The Purchase Price includes a one-time royalty payment (if any), which provides the Buyer with immunity to operate the Equipment specified in the Quotation under any applicable patents.

9 Clarifications and Exceptions

#	Comments and/or Exceptions
1	North Aurora will be reusing all other auxiliary equipments.
2	North Aurora to modify existing electrical power in order to provide required power to each OSG units as per OSG Data Sheet.

10 Buyer/Owner Responsibility

Potable Water

- MaximOS™ OSG Requirements:
  - 84 gallons per hour (1.4GPM) at a minimum continuous pressure of 25 PSIG to each OSG units.
- MaximOS™ OSG Feed Water Temperature:
  - Minimum of 50 °F and a maximum of 80 °F.

Power

- Dedicated 208 - 240 volt, 1 phase, 120 amp service for each 100 Lbs/Day cell cabinet.
- Electrical wiring, conduit and other utilities for complete system.

Facilities

- Floor drain to accommodate periodic water softener recharge wastewater.
- Heated/cooled facility or building for enclosure of system (note that the salt storage/brine maker tank can be installed outdoors. Room temperature requirement is 45 °F – 110°F.
- 2” CPVC vent vertical piping from each solution tank’s dome to the outside of the facility.
- 2” CPVC vent vertical piping from each solution tank’s Liquid Barrier Down Tube Hydrogen Vent Inlet to the outside of the facility.

Consumable Items

- Salt
- Electrical Power
- Potable Water

Miscellaneous

- Appropriate connections to injection system for injection of Sodium Hypochlorite.
- Does not include installation related items including interconnecting piping, materials, labor, taxes, permits, equipment off loading, positioning or storage.
- Federal, State or local sales, use or other taxes are not included in the sales price.

11 Acceptance

Please return one signed copy of this Proposal, or your Purchase Order, to Parkson Corporation at the address below. Refer to Proposal No.: P02600601, date, and related correspondence.

Issued By:

PARKSON CORPORATION
1401 West Cypress Creek Road
Fort Lauderdale, FL 33309-1969

Name:	Luc La Haie
Title:	Product Specialist
Date:	Monday, September 12, 2016

Accepted By: (Herein called the Buyer)

Purchase Order: _____

Name	
Title:	
Date:	

Enclosures: Standard Conditions of Sale, Quotation Addendum, General Arrangement Drawing, Clarifications and Exceptions

Local Rep:

George Argiris
Drydon Equipment, Inc.
2445 Westfield Dr. Suite 100
Elgin, IL 60124
Phone: (224) 629-4060
Fax: (224) 629-4061

cc: Ron Maiorana, Randy Otts & George Argiris

12 Proposal Addendum

As a result of dramatic cost increases in the cost of both stainless and carbon steel, please be advised that the following provisions shall be strictly enforced pursuant to the Equipment advertised in this Quotation:

1. The Quotation's Purchase Price shall be firm for thirty (30) calendar days unless stated otherwise in the Quotation. Any Purchase Order issued beyond this timeframe may result in a Purchase Price review by Parkson Corporation whereby the Purchase Price may be increased to cover the increases in material costs. This Purchase Price review shall be at Parkson Corporation's sole discretion.

2. For those customers that have requested a firm Purchase Price commitment in excess of thirty (30) calendar days, Parkson has utilized an escalation clause tied to an appropriate commodity index to determine the Purchase Price.

3. All Purchase Orders that have a delivery schedule stretching beyond six (6) months from the time a Purchase Order is placed will be subject to price escalation tied to a proportionate increase in total material costs as a result of either stainless or carbon steel surcharges in effect at the time Parkson Corporation places its orders for any fabricated steel components for the Equipment. Parkson Corporation will notify you of any changes in prices once all orders for said components have been completed.

JCG
Effective 4/27/04

Standard Conditions of Sale

I. GENERAL: All references to Parkson (or any derivative thereof) shall mean Parkson Corporation and all references to Buyer shall mean the customer named in a purchase order, quotation or proposal (collectively referred to herein as "quotation"). All quotations from Parkson shall be considered solicitations of offers and all purchase orders placed by Buyer shall be considered offers, which can only be accepted in writing by Parkson. Buyer shall either sign Parkson's quotation, or in the alternative, issue a non-conflicting purchase order containing necessary information, such as site name, price schedule, type and quantity of product, requested delivery date and delivery instructions. Parkson hereby objects to and rejects any and all additional or different terms proposed by Buyer, whether contained in Buyer's request for quotation, purchase order, purchasing or shipping release forms. Notwithstanding any terms or conditions that may be included in Buyer's purchase order form or other communications, Parkson's acceptance is conditional upon Buyer's assent to the terms and conditions set forth herein. It is agreed that sales are made only on the terms and conditions herein and any other terms or conditions shall not become a part of the agreement unless expressly agreed to in writing by Parkson. Parkson's failure to object to any terms or conditions contained in Buyer's purchase order or other communication shall not be deemed to be acceptance of such terms or conditions. These terms and conditions shall be deemed incorporated (as though set forth in full) into any agreement entered into between Parkson and Buyer unless otherwise noted in writing. Parkson reserves the right, without any increase in price, to modify the design and specifications of Parkson products, provided that the modification does not adversely affect the original performance specifications as specified by Parkson or as requested by Buyer. Shipments, deliveries and performance of work shall at all times be subject to the approval of Parkson's Credit Department. Parkson may at any time decline to make any shipment or delivery or perform any work except upon receipt of payment or security or upon terms and conditions satisfactory to Parkson.

II. PRICES, TERMS OF PAYMENT & TAXES: (a) **PRICES**: Unless expressly stated to be firm for a definite period, Parkson's offers are subject to change without notice, and in all cases are subject to withdrawal at any time before acknowledgment by Buyer. Quoted prices are firm for only thirty (30) days. Orders placed after thirty (30) days are subject to price increases in Parkson's sole discretion. Prices on acknowledged orders are firm for the agreed upon delivery time. Customer requests to extend originally agreed upon delivery date(s) will be subject to price escalation. If a price is stated in the quotation, it is based upon shipment of the quantities and quality requested by Buyer and on the basis of Parkson's internal delivery schedule at the time of preparation of said quotation. (b) **TERMS OF PAYMENT**: Payments against invoices shall be due and payable thirty (30) days from the date of delivery to a carrier, or upon receipt of an invoice from Parkson, whichever first occurs. If in Parkson's opinion, Buyer's financial condition does not justify continuation of production or shipment on the terms of payment specified, Parkson may, upon written notice to Buyer, cancel or suspend any outstanding order or part thereof, unless Buyer shall promptly pay for all goods delivered or shall make advance payments to Parkson as it, at its option, shall determine. If Buyer delays shipment for any reason, date of readiness for shipment shall be deemed to be the date of shipment for payment purposes. If Buyer delays manufacture for any reason, a payment shall be made based on purchase price and percentage of completion, with the balance payable in accordance with the terms as stated. If payments are not made in conformance with the terms stated herein, the contract price shall, without prejudice to Parkson's right to immediate payment, be increased by 1½% per month on the unpaid balance, not to exceed the maximum amount permitted by law. If at any time in Parkson's judgment Buyer may be or may become unable or unwilling to meet the terms specified herein, Parkson may require satisfactory assurance or full or partial payment as a condition to commencing, or continuing manufacture, or in advance of shipment. (c) **TAXES**: Except for the amount, if any, of tax stated in a Parkson quotation, the prices set forth therein are exclusive of any amount for federal, state, local, excise, sales, use, property, in-country, import, VAT or similar taxes or duties. Such prices also exclude permit, license, customs and similar fees levied upon shipment of Parkson products.

III. SHIPMENT/STORAGE: (a) SHIPMENT: The anticipated shipment date(s) set forth in the quotation is/are approximate and subject to change. Notwithstanding other limitations set forth by Parkson, Parkson shall not be liable for any delays in shipment which are caused by events beyond the control of Parkson including, but not limited to, delays caused by inaccurate or incomplete data, changes or revisions in the work to be performed, tardy approval of drawings by Buyer, acts of Buyer or Buyer's agent, Force Majeure, accidents, strikes, inability to obtain labor or materials, or delay in transportation. Parkson shall have the right to extend the anticipated shipment date for up to ten (10) business days, for any reason, provided Parkson shall give Buyer written notice of such delay prior to the scheduled shipping date. Buyer's order will be crated for domestic truck shipment and Parkson assumes no responsibility for loss of, or damage to, the equipment following delivery to a carrier, who shall be deemed to be acting as agent for Buyer, and the equipment shall thereafter be at the Buyer's sole risk. It is Parkson's policy to ship its equipment "Bill Collect," and the carrier will mail its invoice(s) directly to Buyer's billing address, unless otherwise agreed to in writing. **(b) STORAGE**: Once Buyer has been notified that its order is ready for shipment, if Buyer requests that the order (in whole or in part) not be shipped until a later date, the equipment will be segregated from other inventory and Buyer shall execute Parkson's Transfer of Title form evidencing transfer of title and transfer of risk of loss from Parkson to Buyer pursuant to Section IV below. In the event that Buyer shall refuse to execute Parkson's Transfer of Title form and/or if the fabricator is unable to withstand storage of the equipment, Parkson shall have the right, at its sole discretion, to transfer the equipment to an intermediate storage facility, all at Buyer's cost, whereby transfer of title and risk of loss will be deemed to pass, pursuant to Section IV below, when the products are delivered to the carrier at the factory. All costs associated with shipping the equipment to said storage facility or from said storage facility to the job site (or any other site requested by Buyer) shall be the responsibility of Buyer. Buyer shall reimburse Parkson upon demand for any costs incurred by Parkson in connection with said storage, including without limitation, steps taken to protect the equipment from the elements, transport, storage facility fees, insurance, etc. Any delay in shipment requested or caused by Buyer or its agents will not affect the Terms of Payment above.

IV. TITLE & RISK OF LOSS: Parkson's prices are F.O.B. Parkson's Factory and are exclusive of taxes, shipping, handling and insurance. Title to all equipment and risk of loss, deterioration or damage shall pass to Buyer upon delivery to a carrier; except that a security interest in the equipment or any replacement shall remain in Parkson's name, regardless of mode of attachment to realty or other property, until the full purchase price has been received by Parkson. Buyer agrees to do all acts necessary to perfect and maintain said security interest, and to protect Parkson's interest by adequately insuring the products against loss or damage from any external cause, including during any storage or transport, with Parkson named as insured or co-insured. Any claim by Buyer against Parkson for shortage or damage occurring prior to delivery must be made in writing within ten (10) calendar days after receipt of shipment and accompanied by an original transportation bill signed by the carrier noting that carrier received goods from Parkson in the condition claimed. Parkson shall have the right to ship all goods at one time or in portions, within the time for shipping provided in such order, unless specifically requested in writing by the Buyer that these shipments be made in total. Any shipments returned to Parkson as a result of Buyer's unexcused delay or failure to accept delivery will require Buyer to pay all additional costs incurred by Parkson, including any storage costs as set forth in Section III above.

V. ERECTION: Unless otherwise agreed in writing, products are assembled, installed and/or erected by and at the full expense of Buyer.

VI. CANCELLATION & BREACH: Buyer agrees that Parkson products are specially manufactured goods that are not suitable for sale to others in the ordinary course of business. Therefore, purchase orders placed with Parkson cannot be canceled without recourse, nor shipments of goods made up, or in process, be deferred beyond the original shipment dates specified, except with Parkson's written consent and upon terms which shall indemnify Parkson against all loss. In the event of cancellation or the substantial breach of the agreement between Buyer and Parkson, including without limitation, failing to make payment when due, Buyer agrees that Parkson will suffer serious and substantial damage which will be difficult, if not impossible, to measure, both at the time of entering the agreement and as of the time of such cancellation or breach. Therefore, the parties agree that upon such cancellation or breach, the Buyer shall pay to Parkson the sums set forth below which Parkson and Buyer do hereby agree shall constitute agreed and liquidated damages in such event:

a. If cancellation or breach shall occur after the acceptance of the purchase order but prior to mailing of general arrangement drawings by Parkson to Buyer, liquidated damages shall be 10% of the selling price.
b. If cancellation or breach shall occur within thirty (30) days from the mailing of general arrangement drawings by Parkson to Buyer, the liquidated damages shall be 30% of the selling price.
c. If the cancellation or breach occurs after thirty (30) days from the mailing of general arrangement drawings by Parkson to Buyer, but prior to notification that the order is ready for shipment, the liquidated damages shall be the total of 30% of the selling price plus the expenses incurred, cost of material, and reasonable value of the work expended to fill the respective order by Parkson's engineers and other employees, agents and representatives after the mailing of general arrangement drawings by Parkson to Buyer. All sums will be determined at the sole reasonable discretion of Parkson provided, however, that the total liquidated damages under this provision shall not exceed the total selling price.
d. If cancellation or breach shall occur after Parkson has notified Buyer that the order is ready for shipment, then the liquidated damages shall be the total selling price.

VII. DRAWINGS & SPECIFICATIONS: In the event that drawings are sent to Buyer for approval after an order is placed, the drawings must be returned marked "Approved" or "Approved As Noted" within twenty (20) calendar days after receipt unless otherwise noted. In the event that Buyer's written comments are not given within the twenty (20) day period, Parkson shall deem the items approved.

VIII. CORRECTIVE WORK & "BACK CHARGES". In no event shall any work be done, or services or material be purchased or expense otherwise incurred by the Buyer for the account of Parkson until after full and complete particulars (including an estimate of material cost) have been submitted in writing and approved in writing by Parkson. Parkson must be given the opportunity to discuss and research alternative methods to lower the costs involved in such corrective work. Unless agreed-upon in writing by Parkson, Parkson will not be liable for labor costs, overhead, administrative costs, interest or any other consequential or indirect costs Buyer incurs. Returned items will not be accepted unless Parkson has previously agreed to such return in writing and supplied written return-shipping instructions to Buyer.

IX. SELECTION OF MATERIALS: Because all Parkson products are specially manufactured products, the material make-up of many of Parkson's products varies from project to project. The determination of the materials' suitability and adaptability (including without limitation, paints and/or coatings) to the specific needs of the Buyer is solely the Buyer's choice and responsibility.

X. CONFIDENTIAL INFORMATION & IMPROVEMENTS: The design, construction, application and operation of Parkson's products, services and relevant documentation embody proprietary and confidential information; therefore, Buyer will maintain this information in strict confidence, will not disclose it to others, and will only use this information in connection with the use of the products or to facilitate the provision of services sold by Parkson. Buyer will not copy or reproduce any written or printed materials or drawings furnished to Buyer by Parkson. Buyer agrees to immediately return all confidential material to Parkson if requested in writing by Parkson. Buyer will not copy any information provided by Parkson or make any design drawings of Parkson's equipment and will not permit others to copy or make any design drawings of the equipment. Parkson shall have a royalty-free license to make, use and sell, any changes or improvements in the products invented or suggested by Buyer or its employees. Buyer acknowledges that a remedy at law for any breach or attempted breach of this Section will result in a harm to Parkson for which monetary damages alone will not be adequate. Buyer

covenants and agrees that neither it nor any of its affiliates will oppose any demand for specific performance and injunctive and other equitable relief in case of any such breach or attempted breach. Notwithstanding anything to the contrary herein, Parkson may seek enforcement of any breach of this Section without the necessity of complying with the provisions regarding resolution of disputes herein.

XI. FIELD SERVICE: Field Service included in the quotation will only be scheduled upon written request and may be subject to credit approval. Should the Buyer have outstanding balances due Parkson, no startup / field service will be scheduled until such payments are received by Parkson. The Buyer assumes all responsibility for the readiness of the system when it requests startup service. Should Parkson's Field Service Engineer arrive at the jobsite and determine that the system cannot be started up within a reasonable time, Parkson shall have the option to bring the Field Service Engineer home and bill the Buyer for time, travel and living expenses. Additional field service is available from Parkson at the prevailing per-diem rate at the time of the request for service plus all travel and living expenses, portal-to-portal. A purchase order or change order will be required prior to scheduling this additional service.

XII. LIMITATION OF LIABILITY: Unless expressly agreed to in writing by Parkson, all damages not direct and actual in nature, including without limitation, consequential, incidental, indirect, exemplary and punitive damages, shall be expressly prohibited damages. Such prohibited damages include, but are not limited to, lost rent or revenue; rental payments; costs (increased or not) of administration or supervision; costs or delays suffered by others unable to commence work or provide services as previously scheduled for which a party to this contract may be liable; increased costs of borrowing funds devoted to the project (including interest); delays in selling all or part of the project upon completion; damages caused by reason of Force Majeure or acts of God (with the broadest statutory or court of law definition possible); termination of agreements to lease or buy all or part of the project, whether or not suffered before completion of services or work; forfeited bonds, deposits, or other monetary costs or penalties due to delay of the project; interest for any reason assessed to Buyer; increased taxes (federal, state, local, or international) due to delay or recharacterization of the project; lost tax credits or deductions due to delay; impairment of security; attorney and other legal fees for any reason assessed to Buyer, loss of use of the Equipment or any associated Equipment, costs of substitute Equipment, facilities or services, down time costs, claims of customers of Buyer for such other damages; or any other indirect loss arising from the conduct of the parties. Parkson only agrees to responsibility for damages from proven negligent and willful acts of its direct employees only.

XIII. APPLICABLE LAWS & GOVERNING LAW: To the best of Parkson's knowledge, Parkson products comply with most laws, regulations and industrial practices; however, Parkson does not accept responsibility for any state, city or other local law not specifically brought to Parkson's attention. For OSHA compliance, (1) Parkson is only liable for those OSHA standards that are in effect as of the date of the quotation, and to the extent they are applicable to the performance of Parkson. (2) Parkson is only responsible for the physical characteristics of the product(s) and not for the circumstances of the use of the product(s). (3) Parkson's liability through any noncompliance to OSHA shall be limited to the cost of modifying the product(s) or replacing the non-complying product(s) or component(s) after receipt of prompt written notice of noncompliance. The rights and obligations of Buyer and Parkson shall be governed by and interpreted in accordance with the substantive laws of the state of Florida including the uniform commercial code of Florida, excluding conflicts of law and choice of law principles.

XIV. DISPUTE RESOLUTION: Any issue, difference, claim or dispute ("Action") that may arise out of or in connection with the project referenced in the quotation, including these terms and conditions, shall be first resolved by negotiation at the highest executive levels between the Buyer and Parkson. If said negotiation is unsuccessful, any said Action or any transactions contemplated hereby or in the Quotation shall be finally settled under BINDING ARBITRATION in Broward County, Florida. Any such arbitration shall be governed by the Commercial Arbitration Rules of the American Arbitration Association and shall be overseen by one (1) single arbitrator. Buyer and Parkson shall agree upon a single arbitrator or, if Buyer and Parkson cannot agree upon an arbitrator within thirty (30) days, then the Buyer and Parkson agree that the American Arbitration Association shall appoint a single arbitrator. In the event that an Action is brought, the prevailing party shall be entitled to be reimbursed for, and/or have judgment entered with respect to, all of its costs and expenses, including reasonable attorney's fees' and legal expenses. The award of the arbitrator shall be binding and may be entered as a judgment in any court of competent jurisdiction.

XV. PATENTS: Parkson shall indemnify Buyer against any judgment for damages and costs which may be rendered against Buyer in a suit brought on account of the alleged infringement of any United States patent by any product supplied by Parkson, unless (a) the alleged infringement occurs as a result of any alteration or modification to the product or the use of the product in combination with the products or services of any party other than Parkson, or (b) the product was made in accordance with materials, designs or specifications furnished or designated by Buyer, in which case Buyer shall indemnify Parkson against any judgment for damages and costs which may be rendered against Parkson in any suit brought on account of the alleged infringement of any United States patent by such product or by such materials, designs or specifications; provided that prompt written notice be given to the party from whom indemnity is sought of the bringing of the suit and an opportunity be given to such party to settle or defend it as that party may see fit and that every reasonable assistance in settling or defending it shall be rendered. Parkson shall in no event be liable to Buyer for special, indirect, incidental or consequential damages arising out of allegation of patent infringement.

XVI. MECHANICAL WARRANTY: For a period of one (1) year following the Equipment shipment date ("Warranty Period"), Parkson's Equipment is limitedly warranted to be free from defective material and workmanship, under normal use and service and when installed, operated and maintained in accordance with installation instructions, this policy and maintenance/operating procedures. To make claim under this Warranty, Buyer must notify Parkson within ten (10) business days after the date of discovery of any nonconformity and

make the affected Equipment immediately available for inspection by Parkson or its service representative. Parkson Equipment may be deemed nonconforming only by an authorized Parkson representative. **Returns will not be accepted unless Parkson has authorized said return in writing.** If Parkson's inspection indicates nonconforming materials and/or workmanship, the Equipment will, at Parkson's option, either be repaired or replaced without charge. Upon receipt of Parkson's written consent, Equipment may be promptly returned to Parkson, F.O.B. its factory. However, under certain circumstances, Parkson may decide, in its sole discretion, to repair or replace the Equipment at the Project site. Buyer hereby agrees to provide Parkson, its employees and/or representatives, free of charge, on-site access to the Project site, and any necessary utilities and plant personnel needed by Parkson for the purpose of repairing and/or replacing nonconforming Equipment per this Warranty.

The following will void this Warranty:

(A) Equipment is used for purposes other than those for which it was designed;
(B) Equipment is not used in accordance with generally approved practices;
(C) Disasters, whether natural or manmade, such as fire, flood, wind, earthquake, cave-in, lightning, war, or vandalism;
(D) Unauthorized alterations to or modifications of the Equipment not approved by Parkson, in writing;
(E) Abuse, neglect or misuse of Equipment, including without limitation, operation of Equipment after a defect is discovered;
(F) Operation of Equipment by persons not properly trained for that purpose;
(G) Failure to operate the Equipment in accordance with Parkson's specifications, O&M manuals or other written guidelines; and/or
(H) Failure to perform regular cleaning, inspection, adjustment and/or preventative maintenance.

BE ADVISED: Parkson is not liable for any corrective work or expenditure that has not been authorized by Parkson in writing prior to the commencement of such work and prior to committing to such expenditures. Inspection service calls, requested by Buyer, where no evidence of nonconforming materials and/or workmanship is found, will be invoiced to the Buyer at Parkson's current per diem, plus all travel and living expenses. Onsite labor and freight are not covered by this Warranty. This Warranty does not cover normal wear and tear. Following a Warranty claim, verification of proper operation and maintenance is required. Physical damage due to external forces and/or accident is not covered by this Warranty. The effects of corrosion and unforeseeable influent characteristics are excluded from this Warranty. Actions by 3rd parties in causing nonconformity of the Equipment are not covered under this Warranty.

THE FOREGOING LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER GUARANTEES AND WARRANTIES OF ANY KIND WHATSOEVER, WRITTEN, ORAL OR IMPLIED; ALL OTHER WARRANTIES INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED.

XVII. INDEMNIFICATION: Buyer shall comply and require its employees to comply with all instructions given by Parkson regarding installation, use and maintenance of the Equipment sold by Parkson and shall require its employees to use reasonable care and all safety devices in the operation and maintenance of said Equipment. Buyer shall not remove or permit removal or modification of any safety device, warning sign or label. Buyer shall immediately give Parkson written notice of any personal injury or property damage arising out of the use of the Equipment and cooperate with Parkson in investigating any such accident or malfunction. Buyer agrees to indemnify and hold Parkson and its suppliers harmless from any and all claims, demands, liabilities, causes of action, suits, costs and expenses of any kind and nature (including attorney's fees) for personal injury or property damage arising from or in any way connected with the operations, activities or use of the Equipment sold by Parkson if Buyer fails to fulfill any of the foregoing obligations. Buyer agrees to indemnify and hold Parkson and its suppliers harmless from any and all claims, demands, liabilities, causes of action, suits, costs and expenses of any kind or nature (including attorney's fees) which may be asserted against Parkson and its suppliers by any person relating to any portion of the Equipment which includes Buyer's existing equipment or equipment furnished by Buyer and to defend Parkson and its suppliers at Buyer's expense against any suit which may be commenced relating to the foregoing. Buyer agrees to indemnify and hold Parkson and its suppliers harmless from any and all claims, demands, liabilities, causes of action, suits, costs and expenses of any kind or nature (including attorney's fees) for loss or damage to persons or property, other than the Equipment sold hereby or Buyer's possession or use of said Equipment.

XVIII. MISCELLANEOUS: Parkson does not assume responsibility for nor warrant the performance or accuracy of Buyer's furnished design, design criteria, or specifications. The parties agree that the foregoing terms and conditions constitute the entire terms and conditions between Buyer and Parkson and that there are no other agreements, terms or conditions, expressed or implied, unless otherwise agreed to in writing by Parkson. The terms and conditions herein shall supersede any terms and conditions of any other document that may apply to the transaction between the Buyer and Parkson. This document may not be modified or superseded other than by an instrument in writing signed by both Buyer and Parkson. This document shall be binding upon and inure to the benefit of Buyer and Parkson and their heirs, assignees, legal representatives and the project Owner for the project referenced in the quotation. The invalidity or non-enforceability of any particular provision of this document shall not affect the other provisions hereof, and this document shall be construed in all respects as if such invalid or unenforceable provisions were omitted.

Optional Annual On-Site Service

Operations & Service Task	Annual System Assessment
Visual Inspection of System	**X**
Check System for Leaks	**X**
Check Salt Level	**X**
Record System Parameters – Daily Logs	**X**
Evaluate Daily Logs for Trends	**X**
Water Hardness Test – Inlet/Outlet	**X**
Free Available Chlorine solution concentration (FAC)	**X**
Acid Cleaning of Electrolytic Cell	**X**
Filter Check and replacement if required	**As Required**
Water Softener Regeneration Checks	**X**
System evaluation during startup sequence	**X**
System Diagnostics	**X**
Cell lead verification – Re-torque if required	**As Required**
Electrical evaluation - Power Supply & Electrolytic Cell	**X**
Brine & Oxidant tank Assessment	**X**
Auxiliary Equipment Evaluation	**X**
Flow Measurement	**X**
Calibration of cell current sensor if required	**X**
Refresher training	**X**
Written Report	**X**

Integral Control System

1.1 Each generator is controlled via an Allen Bradley Micro Logix 1400 PLC to maintain consistent cell and system operation.

1.2 The user interface is an Allen Bradley panel view plus 5.7 in. screen.

1.3 Control system is integrated into the sodium hypochlorite generator enclosure.

1.4 Each OSGH has the following Alarms and Status:

a. Master Switch Off – Status
b. Low Water Flow – Alarm
c. Power Supply Thermal Switch – Status
d. Inlet Water Pressure Low – Alarm
e. Oxidant Tank Level Low – Status
f. Oxidant Tank Level High – Status
g. High Oxidant Temperature – Alarm
h. High Power Supply Temperature – Alarm
i. Low Cell Current – Alarm
j. High Cell Current – Alarm
k. Low Cell Voltage – Alarm
l. Very High Cell Current – Alarm
m. Low Brine Pump Voltage – Alarm
n. Low Feed Water Temperature – Alarm
o. High Feed Water Temperature – Alarm
p. High Oxidant Shutdown Temperature – Alarm

1.5 Integral Overall System Controls/Monitoring

a. Connection to site SCADA systems shall be provided through Ethernet port with Ethernet/IP, DNP3 over IP, and Modbus TCP/IP protocol support, as well as web server capabilities.

(i) Shall also have serial capabilities via DF1/DH485/Modbus RTU/DNP3/ASCII protocol support

b. Control system shall have, but not be limited to, the following I/O:

(i) Inputs
1. Oxidant Tank Level
2. Hydrogen Monitor
3. Hardness Monitor
4. Auxiliary Dilution Air System

(ii) Outputs
1. Auxiliary Dilution Air System
2. Dry contact water boost pump relay
3. Dry contact brine boost pump relay
4. Dry contact alarm output relay

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MaximOS™ Small Series SCADA Communications

Modbus TCP/IP Details

The MaximOS™ OSG system parameters are being transferred via Modbus TCP/IP to a remote device.

The remote device is expected to be able to receive Modbus data in the form of word, long and real data types.

AB Micrologix 1400 PLC Attributes:

PLC Version Compatibility: 3.2.0

Driver:	Modbus TCP/IP Slave	
	IP Address:	Configurable/Site provided
	Mask:	Configurable/Site provided
	Gateway:	Configurable/Site provided
Driver Settings	TCP Port: 502	
	Session Limit: 2	
Data Format:	All variables are provided in the format of integer. Floating point numbers are multiplied by a base 10 scaling factor, where applicable, to maintain resolution. The received integers will need to be divided but the appropriate value to accurately receive the floating point number.	
Note:	Modbus is an open communications standard. Given the many different manufacturers of equipment, the flexibility to interpret and create variations upon the standard makes providing a 'one size fits all configuration', difficult.	

Block 1 Details: Read only, Word as Word; Radix=Decimal

Parameter	Modbus Address	Details
MODE	40000	See Details Below
HARD FAULT WORD #1	40001	See Details Below
HARD FAULT WORD #2	40002	See Details Below
SOFT FAULT WORD #1	40003	See Details Below
HEARTBEAT	40004	Used in remote control
NOT USED	40005	
INPUTS WORD #1	40006	See Details Below
INPUTS WORD #2	40007	Not Used
OUTPUTS WORD #1	40008	See Details Below
MODE STEP	40009	See Details Below
SELF CLEAN CYCLES	40010	NUMBER OF RP CYCLES
FLOW PWM	40011	IN PERCENTAGE
LOCAL START STOP STATUS	40012	START=1, STOP=0
REMOTE LOCAL STATUS	40013	REMOTE=1, LOCAL=0
LED WORD	40014	See Details Below
MODESTEP	40015	See Details Below

Block 2 Details: Read only, Word as Word; Radix=Decimal

Parameter	Modbus Address	Details
CURRENT SENSOR #1	30000	Multiplied by 10; IN AMPS
INTERNAL WATER TEMP.	30001	Multiplied by 10; IN UNITS OF SYSTEM (F or C)
INTERNAL OXIDANT TEMP.	30003	Multiplied by 10; IN UNITS OF SYSTEM (F or C)
INTERNAL CELL VOLTAGE	30005	Multiplied by 10; IN VOLTS
WATER PRESSURE	30007	Multiplied by 10; IN UNITS OF SYSTEM (F or C)
BRINE PUMP CONTROL VOLTAGE	30009	Multiplied by 100; IN VOLTS
TOTAL CURRENT	30011	Multiplied by 10; IN AMPS
SYSTEM HOURS	30013	IN HOURS
CELL HOURS	30015	IN HOURS

Block 3 Details: Read/Write, Word as Word; Radix=Decimal

Parameter	Modbus Address	Details
REMOTE START STOP	00000	Writable from remote Device; see sequence below.
WATCHDOG ENABLE	00016	Writable from remote Device; see sequence below.
WATCHDOG RESET	00032	Writable from remote Device; see sequence below.

MODE (400001)	
Value	Description
1	Standby
2	Start Up
3	Run
4	Normal Shutdown
7	Stop
8	Setup
9	Diagnostic
10	Fault
11	Self Cleaning

MODE STEP (400016)	
Value	Description
1	Standby
23	Startup - Filling Cell
24	Startup - Flushing Cell
25	Startup - Stabilizing Flow
210	Start Up Into Run Mode
31	Running - Near Operation Window
32	Running - In Operation Window
43	Shutdown - Lowering Current
45	Shut Down - Flushing Cell
49	Shut Down - Check restart loop
410	Shut Down - Dilution Air
411	Shut Down - Check standby
10	Faulted
7	Stop
80	Setup Mode
90	Diagnostic Mode
110	Self - Cleaning Mode

LED WORD (400015)	
Value	Description
1	Yellow
2	Green
3	Flashing Green
4	Red
5	Flashing Yellow
6	Flashing Red
7	Flashing Green Yellow Red

HARD FAULT WORD #1 (400002)	
Bit	Description
0	*Not Used*
1	*Not Used*
2	High Feed Water Flow Rate
3	Rupture Disk Fault
4	*Not Used*
5	*Not Used*
6	Vey High Cell Current Fault
7	Low Cell Voltage Fault
8	Very High Oxidant Temp Fault
9	High Brine Pump Voltage Fault
10	Low Brine Pump Voltage Fault
11	*Not Used*
12	Low Water Pressure Fault
13	Cell Interlock To Display
14	Low Feed Water Temp Fault
15	*Not Used*

HARD FAULT WORD #2 (400003)	
Bit	Description
0	External Dilution Air Fault
1	*Not Used*
2	No Flow Sensor Fault
3	Hydrogen Monitor Fault
4	High Water Pressure
5	Delta Temp Fault
6	Low Water Solenoid PWM Control
7	High Water Solenoid PWM Control
8	Low Cell Current
9	Interlock Fault
10	Low Feed Water Flow Rate Fault
11	Hardness Monitor Fault
12	Undefined Tank Level
13	*Not Used*
14	*Not Used*
15	*Not Used*

SOFT FAULT WORD #1 (400004)	
Bit	Description
0	Run/Stop Switch in Stop
1	Loss of SCADA fault
2	*Not Used*
3	*Not Used*
4	*Not Used*
5	Oxidant Tank Full
6	*Not Used*
7	*Not Used*
8	*Not Used*
9	*Not Used*
10	*Not Used*
11	*Not Used*
12	*Not Used*
13	*Not Used*
14	*Not Used*
15	*Not Used*

INPUTS WORD #1 (400007)	
Bit	Description
0	Flow Rate - HSC
1	*Not Used*
2	*Not Used*
3	*Not Used*
4	External Dilution Air System Failure
5	*Not Used*
6	*Not Used*
7	*Not Used*
8	External Oxidant Tank Level Switch Upper
9	External Oxidant Tank Level Switch Lower
10	Hardness Monitor
11	Internal Water Pressure Switch
12	Internal Rupture Disk
13	Internal Run / Stop Switch Status
14	Hydrogen Monitor
15	*Not Used*

OUTPUTS WORD #1 (40009)	
Bit	Description
0	Water Boost Relay
1	Brine Solenoid
2	*Not Used*
3	Internal Indicator Light Red
4	Internal Indicator Light Green
5	Internal Indicator Light Yellow
6	Relay Assembly Forward
7	Relay Assembly Reverse
8	External Dilution Air Enable
9	External Alarm Output
10	Cell Power Supply Enable
11	Brine Boost Relay
12	Cooling Fan #1
13	Cooling Fan #2
14	*Not Used*
15	*Not Used*

Sequence of commands to remotely control Small Series OSG.

1. Local Small Series OSG
    a. Place system in Remote mode from front panel display. (Network configuration page).
        i. 40013 will become 1.
2. Remote SCADA
    a. Place a 1 in 00000 (REMOTE START STOP) to start system.
    b. The register 00032 (WATCHDOG RESET) must be toggled at least every ~5 seconds, otherwise the system will soft fault and shut down.
    c. The heartbeat value is readable at 40004.
    d. The watchdog can also be enabled remotely by placing a 1 in 00016 (WATCH DOG ENABLE).
    e. Remote SCADA: Place a 0 in 00000 (REMOTE START STOP) to stop system.

Parkson
Treating Water Right

MaximOS™

Water Quality

For

On-Site Generators

1 Water Quality

The factors listed below can affect the oxidant demand of each individual water system, the oxidant production of the Parkson OSG, or the life of the cell itself. It is important to use "worst case" measures since water quality can vary from season to season. Concentrations or measurements in brine feed water and/or treated water that are less than the stated limits are not anticipated to have an impact.

			WHAT IS IMPACTED		
	MEASURE	LIMIT	Oxidant Demand	Chlorine Production	Cell Life
Total Hardness**	mg/L (or grains/gal)	< 17.1 mg/L (1 grain/gallon)		✓	✓
Iron (Fe)†**	mg/L	< 1 mg/L	✓		✓
Manganese (Mn)**	µg/L	< 50 mg/L	✓	✓	✓
Fluoride (Fl)	mg/L	< 1 mg/L			✓
Silica (SiO_2)	mg/L	< 80 mg/L		✓	✓
Bromide	mg/L	< 50 mg/L			✓
Cyanide	mg/L	< 1 mg/L			✓
Lead	mg/L	< 2 mg/L			✓
Dissolved Sulfides (as H_2S)	mg/L	***	✓		
Ammonia Nitrogen (NH_3-N)	mg/L	***	✓		
Organic Nitrogen (Org - N)	mg/L	***	✓		
Total Organic Carbon (TOC)	mg/L	***	✓		
pH	-	5-9		✓	✓
Water Temperature Range	°C °F	>4.4°C <35°C**** >40°F <95°F****		✓	✓

** Caution water softeners will remove these components up to a limit. See references to maximum ferrous iron and manganese in water softener documentation. Total hardness affects cell life only in that higher hardness requires acid washing to remove carbonate deposits from the cell. Use of water softened < 1 grain hardness should not require acid washing of the cell.

*** Oxidant demand is affected by any level of H2S, ammonia or organic nitrogen, or TOC.

**** Between 40˚F and 50˚F salt usage will go up ≈ 20-25% and power usage will go down ≈ 10%. Between 80˚F and 95˚F salt usage will go down ≈ 10% and power usage will go up ≈ 10%

† Iron may deposit Fe(OH3) on the anode, causing an electrical "blind", which would increase the brine proportion pump signal voltage (brine proportion pump speed) needed for the system to reach the operating window. Chlorine production would remain the same, but salt conversion efficiency will decrease. The same effect is true of silica on the cathode.

Parkson
Treating Water Right

MaximOS™

Water Temperature Guidelines For On-Site Generators

1 Water Temperature Guidelines

Supply feed water temperature will have a direct impact on the salt and power efficiencies of Parkson On-Site Generation Equipment. This is true for all On-Site Sodium Hypochlorite generation equipment. On Parkson's MaximOS systems, temperatures are monitored with temperature probes (thermowells) in order to protect the system from temperature extremes.

Parkson has a recommended supply water temperature range which will keep the On-site Generation Equipment within the industry standard of salt and power consumption rates.

Salt and power consumption rates have a direct impact on the overall operationally cost of On-Site Generation Equipment. In some scenarios, allowing a wider range of supply water temperatures will allow for a more overall cost-effective operational cost by reducing the capital cost and maintenance cost of a chilling or heater system.

1.1 Recommended Temperature Ranges

50°F to 80°F (10°C to 26.67°C)

1.2 Lower Allowable Temperature Ranges

40°F to 50°F (4.44°C to 10°C)

- Salt Consumption: Increased between ~20% to ~25%
- Power consumption: Decreased 10%

Supply feed water temperatures below 40°F (4.44°C) will cause damage to the anodes in the electrolytic cell. Below 40°F, a water heater is required.

1.3 Upper Allowable Temperature Ranges

80°F to 95°F (26.67°C to 35°C)

- Salt Consumption: Decrease between ~20% to ~25%
- Power Consumption: Increase 10%

Supply feed water inlet temperatures in excess of 95°F (35°C) will cause reduced production of chlorine. Over 95°F, a water chiller is required.

Series		Below 40 °F to 50 °F	Recommended 50 °F to 80 °F	Above 80 °F to 95 °F
AE	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~3.15	3.50	~4.00
SM	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~2.70	3.00	~3.45
MM	Salt (lb Salt/lb FAC)	~3.13	2.50	~2.25
	Power (kW-hr/lb FAC)	~3.15	3.50	~4.00
LM	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~2.70	3.00	~3.45
SH	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~1.80	2.00	~2.30
SCH	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~1.80	2.00	~2.30
MH	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~1.80	2.00	~2.30
MH-SC	Salt (lb Salt/lb FAC)	~3.13	2.50	~2.25
	Power (kW-hr/lb FAC)	~3.15	3.50	~4.00
LH	Salt (lb Salt/lb FAC)	~3.75	3.00	~2.70
	Power (kW-hr/lb FAC)	~1.80	2.00	~2.30

Table 1 - Degrees Fahrenheit

Series		Below 4.44 °C to 10 °C	Recommended 10 °C to 26.67 °C	Above 26.67 °C to 35 °C
AE	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~6.93	7.70	~8.86
SM	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~5.94	6.60	~7.59
MM	Salt (kg Salt/kg FAC)	~3.13	2.50	~2.25
	Power (kW-hr/kg FAC)	~6.93	7.70	~8.86
LM	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~5.94	6.60	~7.59
SH	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~3.96	4.40	~5.06
SCH	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~3.96	4.40	~5.06
MH	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~3.96	4.40	~5.06
MH-SC	Salt (kg Salt/kg FAC)	~3.13	2.50	~2.25
	Power (kW-hr/kg FAC)	~6.93	7.70	~8.86
LH	Salt (kg Salt/kg FAC)	~3.75	3.00	~2.70
	Power (kW-hr/kg FAC)	~3.96	4.40	~5.06

Table 2 - Degrees Celsius

Parkson
Treating Water Right

MaximOs™

Salt Guidelines
For
On-Site Generators

Content

1 General Information

Parkson Corporation places importance on the quality of salt used in operating on-site generation equipment. High quality salt minimizes expense and customer equipment maintenance issues while maximizing the quality of the water treated using Parkson equipment. Parkson recommends food grade salt to help optimize the MaximOS™ system(s) performance. Because contaminants can vary widely, even within the same mine, it is vital to request the most recent site specific contaminant analysis. The contaminant analysis should document the date that quality control was performed and the physical location where the salt was mined and processed. Parkson recommends that our customers regularly request salt product data sheets from the manufacturer to ensure consistent quality control. A reputable supplier will include the date of the quality analysis on the specification sheet in addition to the salt mine location. Please note, higher quality salt alone will not ensure reduced maintenance. Water used by the MaximOS™ system must be softened adequately as well.

2 Warranty

Parkson continually strives to review and address all warranty claims in an equitable manner. It is important for our customers to understand that the use of poor quality salt may impact warranty claims. Parkson does not accept liability for any salt selected by the customer for use in MaximOS™ equipment. Parkson reserves the right to deny any claims that could be considered under warranty if the equipment or electrolytic cell is performing below specification or is damaged due to contamination caused by, but not limited to, calcium, magnesium and insoluble material in a salt selected by the customer. NOTE: self-cleaning MaximOS™ systems require the use of salt with a purity of 99.5% NaCl or greater (typically food grade) as described in the "Salt Purity" section below or the warranty is void.

3 Salt Purity

For all **self-cleaning systems**, only salt with a purity greater than 99.5% may be used (typically food grade) or the warranty is void. For all **non-self-cleaning systems**, Parkson recommends salt with a purity level of 99.5% NaCl or greater. Table 1 depicting what Parkson recommends for **non-self-cleaning systems** and what Parkson requires to keep the warranty intact for **self-cleaning systems**. Cationic, anionic, or non-ionic organic polymers are often added as flocculant aids to increase the density and "toughness" of slow-settling floc. In waters of exceptionally high turbidity due to colloidal clays (as is seen often in the Midwest), some treatment plants are able to destabilize the colloidal clays using flocculant aids alone without the primary coagulant chemicals.

Component	Percent Minimum
NaCl (dry)	99.5%
Impurity	**Percent Maximum**
Calcium (in all forms)	0.01%
Magnesium (in all forms)	0.01%
Manganese	0.00002%
Iron (as Fe)	0.0005%
Insoluble	0.005%

Table 1

For several reasons, salt quality is highly variable and Parkson cannot control the quality processes at salt manufacturing sites. Typically, salts with fewer contaminants are more expensive because of additional purification steps during processing. Salt manufacturers usually provide salt product data sheets that list contaminants of concern in each type of salt they sell. Customers assume that the delivered salt will meet the specifications provided by the manufacturers. However, not all contaminants of concern for a specific application will be listed. For example, bromide in salt used for electrolysis can elevate the concentration of bromate in the treated water. Bromate is a water quality concern in drinking water applications, but not necessarily industrial applications.

There are three primary contaminants commonly listed in a salt product data sheet that impact the electrolytic cell; calcium (Ca), magnesium (Mg) and insoluble material. High calcium and magnesium salt concentrations cause accumulation of calcium/magnesium carbonate and magnesium hydroxide in the electrolytic cell. Fouling by these deposits in the cell is the single largest cause of maintenance issues. Insoluble material or solids present in the salt that do not dissolve in water can also deposit in the cell along with carbonates. This co-deposition tends to reduce the effectiveness of acid to remove the carbonates. As a result, longer acid wash times and sometimes physical scrubbing of the cell plates is required to remove the deposit. Other contaminants, such as manganese (Mn) and iron (Fe), are known to affect cell performance by producing an oxide layer that increases the degradation rate of the plates. Parkson recommends that the manganese and iron concentrations in salt not exceed 20 parts per billion in the electrolyte solution entering the cell. Manganese and iron are not included in Parkson's salt specification maintenance worksheet because they are not often reported on salt product data sheets. However, low concentrations of Mg and Ca are associated with low concentrations of Mn and Fe.

MaximOS's Salt Specification Maintenance Worksheet versus Salt Manufacturer's Product Data Sheets.

Although Parkson makes recommendations on the ideal salt for use in the on-site generation process, it is the customer's responsibility to obtain a salt quality analysis (salt specification or product data sheet) from the supplier and determine its suitability for their situation, region and application.

The salt manufacturer's product data sheet should contain information regarding the amount of calcium, magnesium and insoluble material in the salt at a minimum. Parkson and its customers use this standard information to estimate the amount of maintenance that is associated with these contaminants. This salt specification maintenance table is shown in Table 2.

	Lower Limit	Upper Limit	Maintenance
Calcium (Ca) (%)	0.000%	0.020%	Acid wash for 20 minutes at 3,000 hrs / quarterly
	0.020%	0.05%	Acid wash for 20 minutes at 750 hrs / monthly
	0.050%	0.08%	Acid wash twice for 20 minutes each at 24 hrs / daily
	0.080%	---	Calcium Too High
Magnesium (Mg) (%)	0.000%	0.020%	Acid wash for 20 minutes at 3,000 hrs / quarterly
	0.020%	0.05%	Acid wash for 20 minutes at 750 hrs / monthly
	0.05%	0.08%	Acid wash twice for 20 minutes each at 24 hrs / daily
	0.08%	---	Magnesium Too High
Insolubles (%)	0.000%	0.01%	Change brine filter at 750 hrs / monthly
	0.010%	0.05%	Change brine filter at 325 hrs / biweekly
	0.050%	0.1%	change brine filter at 24 hrs / daily
	0.10%	---	Insolubles Too High

Table 2

Please note that the manufacturer's product data sheets do not always give these contaminant concentrations in a standard form and the listing may refer to a brand of salt sourced from different salt mines. Different salt mines have different quality parameters. Be sure to request the salt product data sheet that is specific to the salt you will use in the MaximOS™ system, including the mine location. For drinking water applications, the amount of bromide that may be present in certain salts should be evaluated because bromide can be converted to bromate in the cell.

4 Additives

Most salts have four basic types of additives:

- Hardening agent (Sodium Hexametaphosphate or SHMP)
- Cleanser (Citric Acid based)
- Free flowing/anti-caking agent (Yellow Prussiate of Soda or YPS)
- Detergents/surfactants

Parkson does not recommend the use of salt with additives. However, some customers have successfully used salts with these additives. Note that detergents/surfactants in the salt may cause foaming in the oxidant tank and reduce the effectiveness of the hydrogen venting system due to foam. It may be necessary to increase the vent pipe size. Organic additives such as citric acid can also be a source for additional trihalomethanes and haloacetic acids.

5 Physical Salt Size

Salt that is coarse or extra coarse is preferred. Granular or pelletized salt can be used equally well but requires some extra attention. Pellets that are larger than about ½ inch in size dissolve slowly and can contribute to poor brine concentration in the brine tank, particularly when the salt level is low in the tank. For this reason, it is important to keep the brine generator filled at all times. Also, pelletized salt is too heavy to be pneumatically blown into large bulk brine generators.

6 Brine Filtration

Higher purity salt is often table quality, or food grade salt, in granular form. While this salt will work well, it requires an adaptation for both types of brine generators sold by Parkson, including the ton-sized bulk brine generators and the smaller brine generators with up to 1,000 gallons capacity. The large bulk brine generators must be filled with a two-layer washed quartz rock bed to avoid clogging of the brine intake port. The bottom layer should be 7 inches of quartz rock deep, using rock sizes between ¼ and ½ inch. The top layer should be 5 inches of quartz rock deep, using rock sizes between 1/8 and ¼ inch in size.

For smaller brine generators that utilize granular (fine grain) salt, a special in-tank roughing filter assembly must be used. Contact Parkson for details on this filter assembly. External to the brine generator and prior to the MaximOS™ on-site generator cabinet, a 5-micron filter is required. This usually takes the form of a 10-inch standard filter housing with a 5-micron pleated filter cartridge element. A dual filter housing arrangement is also available to facilitate filter change-out while the systems are operational.

7 NSF Standard 60 Salt

Several state regulatory agencies are now requiring that the source material feeding on-site generators (i.e., salt) must be NSF-60 listed to ensure that no hazardous materials ultimately enter the drinking water supply. NSF-60 ensures that chemicals in contact with drinking water are safe and non-toxic to the drinking water supply. For a list of salt suppliers that offer NSF-60 listed salt, refer to the NSF web site at www.nsf.org. Product and service listings may be found at www.nsf.org/business/search_listings/

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MaximOS™ Small Series Acid Washing Procedure

Contents

Guidelines

- Every 6 months is a good conservative but safe timeframe to acid wash the cell keeping it in good shape. Parkson has had sites that have had calcium buildup without substantial increase in brine pump speed control voltage.
- When brine pump voltage increases by 0.5 VDC, this indicates that the cell is needing more brine to maintain the cell current at the generator's target current - necessary to generate the 0.8% hypo – also reference first bullet point above.
- On some versions of system, there are sensors on the electrolytic cell leads that are monitoring the cell current from different parts of the cell. The controller determines if all parts of the cell are sharing the current drawn by the cell equally. If there is a significant variation of the current drawn by different parts of the cell, the system will fault when that cell current variation exceeds 20%. Different parts of the cell are working at different rates when the cell plates get coated making it difficult to predict these variances. However, if you see a pattern develop over time – for example after 3 months of operation, the system starts to alarm for cell current variation, you acid wash the cell – operation returns to normal – then 3 months later you get a cell current variation alarm…..you now have a repeatable pattern. We suggest you not wait 3 months next time and acid wash at 2 months for example. If this process is followed (examples of timing) your cell will last much longer.

Acid Washing Cell

If the water supplied to your MaximOS™ generator during operation is hard, the plates within the cell will start to be coated with solid impurities such as calcium carbonate. Calcium Carbonate ($CaCO_3$) is usually white in color but can be other colors depending on dissolved salts in the water. Our specification on inlet water quality hardness of less than 1 grain/gallon (17.1 mg/L as CaCO) minimizes this issue. Feeding water to the MaximOS™ generator with hardness levels greater than 1 grain/gallon can quickly cause problems, $CaCO_3$ will most likely be found in the cathode side of the cell. At first, $CaCO_3$ will form a thin hard film and over time, a coating within the cell will grow and flakes will break off and effect system performance. $CaCO_3$ will obstruct, or "blind" the current path where these deposits are located and cause a localized decrease in mixed oxidant (chlorine) production within the cell. Other parts of the cell will compensate for these local non-producing areas and will work harder. If uncorrected, the cell can be damaged.

Actions

1. Acid wash the cell according to the procedure written below.
2. Ensure that the water supplied to the cell meets hardness and purity requirements in "MaximOS™ Water Quality"
3. Ensure that the salt supplied to the cell meets with calcium and magnesium requirements in "Salt Guidelines for MaximOS™ Generators"

Equipment Needed

1. Acid Wash Kit (**Supplied by Parkson**)
   a. Acid wash cell union assembly
      i. Union, ¾" CPVC (only the female half is needed)
      ii. Reducer, ¾"S x 1/2"Th CPVC
      iii. 1/2" MT x 3/8" TB, JG Adapter, PVDF
   b. Two (2) two lengths of 3/8" polyethylene (PE) tubing (7-ft and 5-ft)
2. Equipment Needed (**Not supplied by Parkson**)
   a. Two (2) 5 Gallon buckets or similar container.
   b. Latex "acid" gloves
   c. Face Shield
   d. Apron
   e. Paper towels or rags – 1 Roll
   f. Soft Water
   g. Acid (hydrochloric acid, muriatic acid, citric acid or CLR)
   h. pH Strips

Warning

The system must be shut down and in Stop Mode prior to beginning acid wash procedure.

Step 1 – Draining the Cell

Tools/Parts Required:

5-gallon bucket, paper towels, 5-ft 3/8” PE tubing, 3/8” stem x 3/8” tube – Elbow (PVDF):

Small Series system should be in Standby before proceeding (Refer to the Operations Section of the Manual if you have any questions)

- Place system into Stop Mode by pressing the green mushroom switch. **Do not cut off all power to the OSG.** If the system is running in Run Mode, push the Stop button on the display and the system will go into Shutdown Mode. Wait for the shutdown sequence (water purge cycle) to complete then push the green mushroom switch. The fan (blower) will continue to operate until the system is cooled. It is OK to perform maintenance on systems while the fan is running.
- Position 3-way valve on Oxidant Discharge Line (outside of the OSG cabinet) to the sample/drain position. This isolates the OSG from the Solution Storage Tank
- Open the front plumbing door. Install 5 ft PE tube with 3/8” stem x 3/8” tube - Elbow (PVDF) into the blue handle drain valve. Route the other end of the PE Line to a 5-gallon bucket.
- Drain the cell by opening the blue handle drain valve on the inlet manifold. (See Figure 1)

Figure 1

Note

This is the same tubing used in a later step to connect the brine pump suction to the acid bucket.

- Allow for cell to drain for 20-30 seconds then loosen (crack open) the 1/2” female union on the right hand side of the oxidant outlet piping just before it leaves the cell/plumbing cabinet. (See Figure 2)

Figure 2

- Once the union and drain lines are opened, water will begin to drain from the cell and oxidant plumbing line.
- Discard drained water from the cell
- After the cell is drained, close the blue handle drain valve on the inlet manifold and remove the 5 foot long PE tube (See Figure 1)
- Tighten the female fitting loosened in the previous step
- Capture or soak up any drained water that may have spilled onto plumbing enclosure floor

Note

Ensure that all spilled liquid is cleaned up immediately. The fluid can corrode electrical fittings and metallic plumbing fittings. Capture or soak up any drained water that may have spilled onto plumbing floor.

Step 2 – Preparing the Brine Pump Acid Recirculation

Tools/Parts Required:

3/8” PE tubing (7 foot long and 5 foot long), acid wash cell union assembly, 5-gallon bucket

- Remove the tubing from pump inlet quick disconnect fitting. (See Figure 3)

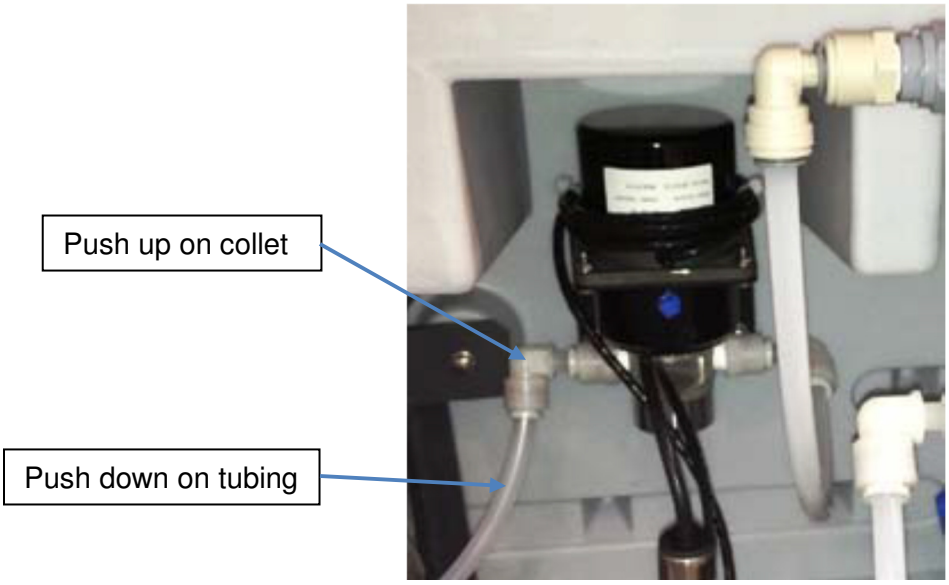

Figure 3

- Route PE tube (5 foot tubing) from **Step 1 – Draining the Cell** and insert it into the brine pump inlet quick disconnect fitting
- The other end of the tubing should be inserted into the 5 gallon bucket.
- The brine pump will suction the acid/water solution from the bucket during the acid washing procedure
- Remove the PE tube with 3/8” stem and Elbow from the brine pump check valve and attach it to the blue handled JG valve used to drain the cell in **Step 1 – Draining the Cell** (see Figure 4)

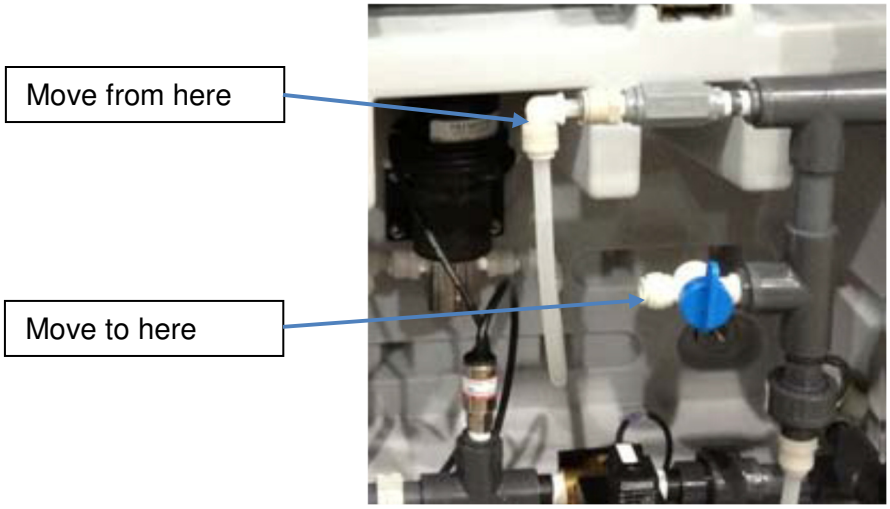

Figure 4

- Remove the ¾” oxidant union assembly (female half) on the outside of the cabinet from the male union half
- Replace the union with the ¾” acid wash cell union assembly and 7 foot tube supplied in the Acid Wash Kit
- Route the other end of this line into the 5-gallon bucket. This will allow acid to be discharged from the cell and provide a return path to the 5-gallon bucket during the acid washing recirculation procedure (See Figure 5)

Figure 5

Note

Capture or soak up the drained water that may have spilled onto plumbing enclosure floor.

Step 3 – Preparing the Acid/Water Mixture

Tools/Parts Required:

Acid, water, latex 'acid' gloves, apron, face shield

Warning

Follow the manufacturer's safety instructions when handling acids. NEVER ADD WATER TO ACID. ALWAYS ADD ACID TO WATER.

- The drain on the cell will NOT permit complete drainage of a cell. Therefore the residual water remaining in the cell is utilized for diluting the acid for a 50/50 mixture.
- In a 5-gallon bucket or similar container prepare one of the following acid solutions.

Note

Refer to Table 1 for determining appropriate volumes of acid and water to generate a 6N HCl acid solution (50/50 mixture) depending on cell size.

If weaker acid solutions are chosen, they are still effective. They will sufficiently clean the cell if allowed to sit longer.

Follow the manufacturer and local area disposal requirements to safely handle and dispose of the used acid

	SM-15 SH-25	SM-30 SH-50	SM-45 SH-75	SM-60 SH-100
Total Cell Volume (mL)	1,100	2,200	3,300	4,400
Cell Residual Drain Volume (mL)	90	180	270	360
Acid Volume (mL)	550	1,100	1,650	2,200
Water added Volume (mL)	460	920	1,380	1,840

Table 1 Volumes for 6N HCl Acid Solution

Example

- To make a 6N HCl acid solution, using an SM-30/SH-50 cell as an example, add 1,100 mL of 37% hydrochloric acid into 920 mL of water. The 180 mL of water that remain in the cell, when mixed with the acid, will provide the proper dilution ratio.
- Muriatic acid (31% hydrochloric acid) can be mixed in the same ratio as above. However this is a weaker acid solution than 6N HCl (equivalent to a 5N HCl Solution).
- Citric acid is a weaker acid solution than either 6N HCl or muriatic acid and can be used without dilution

Caution

ALWAYS ADD ACID TO WATER. NEVER ADD WATER TO ACID.

Step 4 – Starting the Acid Wash Recirculation

Tools/Parts Required:

Latex 'acid' gloves, safety glasses, apron, face shield.

Figure 6

The system is now ready to begin the acid washing cycle (Figure 6).

- From the Main Menu – Enter Diagnostic by pressing on the DIAGNOSTIC button
- Locate Brine Pump Voltage and touch the light blue window (0.00) and a new window will open
- Enter 3 and press on the large check mark to register the new value on the display
- When performed correctly the brine pump will turn ON and the new value will be displayed (3.0)

Caution

If acid solution does not begin to flow immediately, it may be necessary to carefully raise the bucket level above the brine pump level for a flooded suction of the pump. Once flow is established the bucket can be returned to the floor

- Acid will eventually flow from the cell back into your acid bucket.
- Allow the pump to circulate acid/water mixture for about 25-30 minutes (50-60 minutes if using a weaker acid solution or if cell is heavily calcified).
- Follow the same procedure to return Brine Pump Volts to 0.0 to turn OFF the brine pump.
- When finished acid washing, properly dispose of remaining mixture.

Note

The duration requirements for acid recirculation within the cell are dependent on the type of acid and the mineral deposits. If the cell is heavily calcified it may be necessary to prepare a new batch of acid to perform another cycle (2nd wash).

Step 5 – Acid Removal

Tool/Parts Required:

2nd 5-gallon bucket, latex 'acid' gloves, safety glasses, apron, face shield

- Fill the 2nd 5-gallon bucket with water and set nearby.
- With brine pump voltage at 0.00
- Carefully remove the suction line form the 5-gallon bucket with the acid/water mixture
- Place the suction tubing into the a 2nd 5-gallon bucket filled with clean water (used to rinse the cell). Two buckets are now being used simultaneously – one to supply fresh water (supply bucket), the other to collect cell discharge (collection bucket)
- Enter a brine pump voltage of 3.0.
- When the collection bucket is near full, enter a brine pump voltage of 0.0 to turn OFF the brine pump
- Discard water/acid mixture from the collection bucket in accordance to local area and manufacturer's recommendations for proper disposal
- Re-fill the supply bucket with clean water and repeat the process above for rinsing the cell and brine pump
- When the collection bucket is near full for the second time, enter a brine pump voltage of 0.0 to turn OFF the brine pump
- Discard both buckets in accordance to local area and manufacturer's recommendations for proper disposal.

Step 6 – Cell and Pump Reconnection

Tools Required:

5-gallon bucket, paper towels.

- Shut the blue handle drain valve
- Disconnect the PE tube with 3/8" stem and Elbow from the blue handle drain valve and move it up to the brine check valve (See Figure 4).
- Remove the 5 foot long PE tube from the brine pump inlet (suction side) and install it into the blue handle drain valve.
- Route the other end of the PE Line to a 5-gallon bucket or to a nearby drain.
- Drain the cell by opening the blue handle drain valve on the inlet manifold.
- Allow the cell to drain for 20-30 seconds then loosen (crack open) the 1/2" female union on the right hand side of the oxidant outlet piping just before it leaves the cell/plumbing cabinet.
- Once the union and drain lines are opened, water will begin to drain from the cell and oxidant plumbing line
- Discard drained water from the cell
- After the cell is drained, close the blue handle drain valve and remove the 5 foot long PE tube.
- Tighten the female union loosened in the previous step
- Capture or soak up any drained water that may have spilled onto plumbing enclosure or floor.

Note

Ensure that all spilled liquid is cleaned up immediately to prevent corrosion to electrical and metallic fittings.

Step 7 – Return Cell and Pump Plumbing to Normal Operating Conditions

Tools Required:

5-gallon bucket, paper towels or rags

- Install the tubing to the pump inlet (coming from brine solenoid) (See Figure 3)
- Remove the acid wash ¾" cell union assembly and reconnect the oxidant exit plumbing union.
- Verify the blue handle drain valve on the inlet manifold is closed.

Note

The acid washing kit has now been removed. Please look over and tighten any fitting that may be loose and ensure there is a closed loop within the plumbing cabinet.

Step 8 – Cell Water Flush

Tools Required:

None

Caution

IT IS VERY IMPORTANT TO PROPERLY FLUSH THE CELL TO REMOVE ALL ACID. IF ANY ACID REMAINS IN THE CELL WHEN POWER IS SUPPLIED TO THE CELL DURING NORMAL OPERATIONS, DAMAGE WILL OCCUR.

Note

Dispose purged water in drain rather than to storage tank.

- Enter DIAGNOSTICS.
- Initiate a flush by pushing the FLUSH button
- Allow the system to flush fresh water through cell for 10 minutes to remove any residual acid that may remain in cell.
- End the flush by the pushing the FLUSH button again.
- Exit DIAGNOSTICS by pressing the MAIN MENU button.
- Position the 3-way valve on the oxidant discharge line (outside of the OSG cabinet) to the tank position
- The system is now ready for standard operation

Note

You can use pH strips to test the FLUSH water and ensure there is no acid residual before exiting DIAGNOSTICS

Note

A manual flush (possibly using a hose) of the cell may be beneficial after an acid wash to remove any particles or sediment that may have accumulated in the cell during the acid wash. This is especially true for smaller (one or two module) cells as the flow setpoints for these cells are quite low making the system flush less effective for removing particles or sediment that has collected in the cell. A manual flush will have higher flow rates. The cell must be removed from the system to perform a manual flush.

If performing a manual flush, before removing the cell, drain the cell in accordance with step 1 of this procedure. After draining the cell, disconnect the inlet and outlet cell plumbing by loosening the inlet and outlet unions. Disconnect cell leads. Remove the cell.

After the manual flush is complete, re-install the cell, connect inlet and outlet plumbing, connect cell leads.

Fill the cell with water using diagnostics; position the 3-way valve to direct flow back to the solution tank.

Step 9 – System Re-start

Tools Required:

None

- Re-start the system in accordance with the operations and maintenance manual.
- While the system stabilizes water flow, continually check for leaks in the plumbing compartment. Watch the system to ensure it is starting normally.
- Allow the system to operate and stabilize for 15 to 20 minutes.

This Concludes the Procedure

Village of North Aurora
Memorandum

To: Village President and Board of Trustees

From: Bill Hannah, Finance Director

CC: Steven Bosco, Village Administrator

Date: October 13, 2016

RE: Funding of Water Capital Projects Well #8, Well #9 and Water Tower and Approval of Engagement Letters With Chapman and Cutler and Speer Financial

Background

At the September 19th Village Board meeting the Village Board approved engineering agreements for the design and construction of two new deep wells and a 750,000 gallon water tower. The estimated cost of these projects to be constructed over the next two years is $6,150,000 exclusive of engineering.

Staff has evaluated options to fund these projects over the last year based on the timing of when the projects are desired to be completed through a combination of impact fees received, loans or issuance of debt. Now that it has been confirmed that all three projects are to be completed in a two-year period the Village can move forward with securing funding for these projects.

Water Fund Financial Status and Outstanding Debt

As of May 31, 2016 the Water Fund's working capital (fund balance equivalent for Enterprise Funds) was about $2,455,179. This is equal to about 107% of operating expenses in the Fund, a very strong reserve. Some of this reserve, approximately $500,000, is budgeted to be spent in the current fiscal year on the painting of the Auto Mall water tower, replacement of MIOX units at the treatment plants and watermain replacement. The Village's Water Fund reserves fluctuate on an annual basis due to the scope and size of water-related capital projects that need to get done on an annual basis. While some reserves could be utilized for engineering of these projects and a small portion of construction, most of the financing would have to come from borrowed funds.

In 2006, the Village issued $3,500,000 in debt (general obligation alternate revenue bonds) to construct one of the Village's water treatment facilities. This debt was repaid over a 10-year period with final payment to be made December 1, 2016. The annual debt service was about $430,000 a year on average. Final payment of this debt issuance provides the Village with the capacity to issue new debt without having a significant impact on water rates.

General Obligation Alternate Revenue Source Bonds

The Village has the ability to issue general obligation alternate revenue source (GOARS) bonds which are bonds paid by a dedicated revenue source (i.e. water charges, sales tax

revenue) backed by the Village's general obligation taxing authority. This has been done with the construction of the police station (sales tax revenue) and various water system improvements over the years (water charges). Using GOARS bonds to fund water system improvements gives the Village the ability to issue debt at very competitive, low interest rates due to the general obligation taxing authority for the debt, the Village's excellent AA+ credit rating and bank qualification status of the bonds. As the Village does every year for other applicable debt, the Village would abate the tax levy on the bonds and pay the debt with the dedicated water revenues.

If the Village elects to pursue the bond issuance staff would work the Village's financial advisor on terms of the debt issuance specifically number of years of repayment and the amount necessary to issue. For example, a $6,000,000 bond issuance payable over 15 years at current rates would result in annual debt service of about $480,000. The actual amount issued and years for repayment to be considered could be less as the process moves forward. Part of the analysis will also be to ensure that the water rate and water revenues generated provide sufficient debt coverage required per any bond ordinances, also taking into account future operating and capital expenses in the Water Fund.

Next Steps: Approval of Engagement Letters

Should the Village wish to move forward the next step would be to approve engagement letters with the Village's Bond Counsel, Chapman and Cutler, and Village's bond Financial Advisor, Speer Financial. The Village approved an updated, on-going agreement with Speer Financial last year and would only need an approved engagement letter to begin the process. Approval of the agreements does not commit the Village to proceed with a bond issuance at any set schedule, it only lays the groundwork to begin the process.

After approval of the agreements the Village would begin discussions with Speer on timing of the process, begin developing an Official Statement for marketing of the bonds, pass any necessary ordinances to begin the process, then coordinate with Standard and Poor's for a bond rating and proceed with the bond sale and closing.

Attached is an illustrative timeline of the process from Speer. This topic and approval of Engagement Letters was discussed at the October 10, 2016 Finance Committee meeting and it was recommended to move forward to the Village Board for consideration.

VILLAGE OF NORTH AURORA, ILLINOIS
General Obligation Alternate Revenue Bonds, Series 2017

Bond Sale Timetable
As of October 4, 2016

December 5	Board passes bond authorization to be published over the following week. Speer begins drafting Official Statement.
January 2	Board or Village President authorizes BINA Notice to be published prior to January 9.th
January 16th	BINA hearing held by Board.
January 16th	Official Statement to Client and Bond Counsel.
January 26th	Client comments returned to Speer Financial.
Week of January 30th	Rating review.
February 8th	Print Official Statement.
February 20th	Bond sale; Board action.
March 21st	Closing.

RESOLUTION NO._____
Resolution Approving an Engagement Letter with Chapman and Cutler

WHEREAS, the Village of North Aurora ("the Village") desires to undertake the process of issuing General Obligation Alternate Revenue Source bonds for the Waterworks System ("the bonds") for the purpose of financing certain waterworks system improvements; and

WHEREAS, the Village has determined that it is necessary to engage the services of Bond Counsel as part of the process; and

WHEREAS, the Village has utilized Chapman and Cutler LLP in the past for prior bond issuances and bond refundings, and Chapman and Cutler LLP is qualified and willing to serve as Bond Counsel; and

WHEREAS, Chapman and Cutler LLP has provided the Village with a proposed Engagement Letter outlining the services to be performed in this matter and terms of service.

NOW, THEREFORE, be it resolved by the President and Board of Trustees of the Village of North Aurora, as follows:

1. The recitals set forth above are incorporated herein as the material findings of the President and the Board of Trustees.

2. The Engagement Letter from Chapman and Cutler attached hereto and incorporated as Exhibit "A" is hereby approved , and Village staff is hereby authorized and directed to sign the Engagement letter and to commence work with Chapman and Cutler on this matter.

3. This Resolution shall take immediate full force and effect from and after its passage and approval.

Presented to the Board of Trustees of the Village of North Aurora, Kane County, Illinois this _____ day of _____, 2016, A.D.

Passed by the Board of Trustees of the Village of North Aurora, Kane County, Illinois this _____ day of _____, 2016, A.D.

Mark Guethle	_____	Laura Curtis	_____
Mark Gaffino	_____	Chris Faber	_____
Mark Carroll	_____	Michael Lowery	_____

Approved and signed by me as President of the Board of trustees of the Village of North Aurora, Kane County, Illinois this _____ day of _____, 2016 A.D.

_____
Village President Dale Berman

ATTEST:

_____
Village Clerk

Chapman and Cutler LLP
Attorneys at Law · Focused on Finance®

Kyle W. Harding
Partner

111 West Monroe Street
Chicago, Illinois 60603-4080

D 312.845.3278
F 312.516.3278
harding@chapman.com

October 5, 2016

Mr. William D. Hannah
Finance Director
Village of North Aurora
25 East State Street
North Aurora, Illinois 60542

Re: Village of North Aurora, Kane County, Illinois (the *"Village"*)
General Obligation Waterworks Bonds
(Waterworks System Alternate Revenue Source)

Dear Bill:

We are pleased to provide an engagement letter for our services as bond counsel for the bonds in reference (the *"Bonds"*). For convenience and clarity, we may refer to the Village in its corporate capacity and to you, the Village officers (including the governing body of the Village) and employees and general and special counsel to the Village, collectively as *"you"* (or the possessive *"your"*). You have advised us that the purpose of the issuance of the Bonds, briefly stated, is to finance improvements to the waterworks system of the Village. You are retaining us for the limited purpose of rendering our customary approving legal opinion as described in detail below.

A. DESCRIPTION OF SERVICES

As Bond Counsel, we will work with you and the following persons and firms: the underwriters or other bond purchasers who purchase the Bonds from the Village (all of whom are referred to as the *"Bond Purchasers"*), counsel for the Bond Purchasers, financial advisors, trustee, paying agent and bond registrar and their designated counsel (you and all of the foregoing persons or firms, collectively, the *"Participants"*). We intend to undertake each of the following (the *"Services"*) as necessary:

1. Review relevant Illinois law, including pending legislation and other recent developments, relating to the legal status and powers of the Village or otherwise relating to the issuance of the Bonds.

2. Obtain information about the Bond transaction and the nature and use of the facilities or purposes to be financed (the *"Project"*).

3. Review the proposed timetable and consult with the Participants as to the issuance of the Bonds in accordance with the timetable.

4. Consider the issues arising under the Internal Revenue Code of 1986, as amended, and applicable tax regulations and other sources of law relating to the issuance of the Bonds on a tax-exempt basis; these issues include, without limitation, ownership and use of the Project, use and investment of Bond proceeds prior to expenditure and security provisions or credit enhancement relating to the Bonds.

5. Prepare or review major Bond documents, including tax compliance certificates, review the bond purchase agreement, if applicable, and, at your request, draft descriptions of the documents which we have drafted. We understand that the Bonds will be sold at competitive sale and that the Village will be assisted in the preparation of sale documents and in the process of the sale itself by its financial advisor. As Bond Counsel, we assist you in reviewing only those portions of an official statement or any other disclosure document to be disseminated in connection with the sale of the Bonds involving the description of the Bonds, the security for the Bonds (excluding forecasts, projections, estimates or any other financial or economic information in connection therewith), the description of the federal tax exemption of interest on the Bonds and, if applicable, the "bank-qualified" status of the Bonds.

6. Prepare or review all pertinent proceedings to be considered by the governing body of the Village; confirm that the necessary quorum, meeting and notice requirements are contained in the proceedings and draft pertinent excerpts of minutes of the meetings relating to the financing.

7. Attend or host such drafting sessions and other conferences as may be necessary, including a preclosing, if needed, and closing; and prepare and coordinate the distribution and execution of closing documents and certificates, opinions and document transcripts.

8. Render our legal opinion regarding the validity of the Bonds, the source of payment for the Bonds and the federal income tax treatment of interest on the Bonds, which opinion (the *"Bond Opinion"*) will be delivered in written form on the date the Bonds are exchanged for their purchase price (the *"Closing"*). The Bond Opinion will be based on facts and law existing as of its date. Please see the discussion below at Part D. Please note that our opinion represents our legal judgment based upon our review of the law and the facts so supplied to us that we deem relevant and is not a guarantee of a result.

B. LIMITATIONS; SERVICES WE DO NOT PROVIDE

Our Services as Bond Counsel are limited as stated above. Consequently, unless otherwise agreed pursuant to a separate engagement letter, our Services *do not* include:

1. Giving any advice, opinion or representation as to the financial feasibility or the fiscal prudence of issuing the Bonds, including, without limitation, the undertaking of the Project, the investment of Bond proceeds, the making of any investigation of or the expression of any view as to the creditworthiness of the Village, of the Project or of the Bonds or the form, content, adequacy or correctness of the financial statements of the Village. We will not offer you financial advice in any capacity beyond that constituting services of a traditionally legal nature.

2. Except as described in Paragraph (A)(5) above, assisting in the preparation or review of an official statement or any other disclosure document with respect to the Bonds (which may be referred to as the *"Official Statement"*) or performing an independent investigation to determine the accuracy, completeness or sufficiency of the Official Statement or rendering any advice, view or comfort that the Official Statement does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements contained therein, in light of the circumstances under which they were made, not misleading. Please see our comments below at Paragraphs (D)(5) and (D)(6).

3. Independently establishing the veracity of certifications and representations of you or the other Participants. For example, we will not review the data available on the Electronic Municipal Market Access system website created by the Municipal Securities Rulemaking Board (and commonly known as "EMMA") to verify the information relating to the Bonds to be provided by the Bond Purchasers, and we will not undertake a review of your website to establish that information contained corresponds to that which you provide independently in your certificates or other transaction documents.

4. Supervising any state, county or local filing of any proceedings held by the governing body of the Village incidental to the Bonds.

5. Preparing any of the following — requests for tax rulings from the Internal Revenue Service (the *"IRS"*), blue sky or investment surveys with respect to the Bonds, state legislative amendments or pursuing test cases or other litigation.

6. Opining on securities laws compliance or as to the continuing disclosure undertaking pertaining to the Bonds; and, after the execution and delivery of the Bonds, providing advice as to any Securities and Exchange Commission investigations or concerning any actions necessary to assure compliance with any continuing disclosure undertaking.

7. After Closing, providing continuing advice to the Village or any other party concerning any actions necessary to assure that interest paid on the Bonds will continue to be tax-exempt; *e.g.*, we will not undertake rebate calculations for the Bonds without a separate engagement for that purpose, we will not monitor the investment, use or expenditure of Bond proceeds or the use of the Project, and we are not retained to respond to IRS audits.

8. Any other services not specifically set forth above in Part A.

C. ATTORNEY-CLIENT RELATIONSHIP; REPRESENTATION OF OTHERS

Upon execution of this engagement letter, the Village will be our client, and an attorney-client relationship will exist between us. However, our Services as Bond Counsel are limited as set forth in this engagement letter, and your execution of this engagement letter will constitute an acknowledgment of those limitations. Also please note that the attorney-client privilege, normally applicable under state law, may be diminished or non-existent for written advice delivered with respect to Federal tax law matters.

This engagement letter will also serve to give you express written notice that from time to time we represent in a variety of capacities and consult with most underwriters, investment bankers, credit enhancers such as bond insurers or issuers of letters of credit, ratings agencies, investment providers, brokers of financial products, financial advisors, banks and other financial institutions and other persons who participate in the public finance market on a wide range of issues. One or more of such firms may be the winning bidder (*i.e.*, become the Bond Purchasers) at the public sale of the Bonds. Prior to execution of this engagement letter we may have consulted with one or more of such firms regarding the Bonds including, specifically, the Bond Purchasers. We are advising you, and you understand that the Village consents to our representation of it in this matter, notwithstanding such consultations, and even though parties whose interests are or may be adverse to the Village in this transaction are clients in other unrelated matters. Your acceptance of the winning bid constitutes consent to these other engagements. Neither our representation of the Village nor such additional relationships or prior consultations will affect, however, our responsibility to render an objective Bond Opinion.

Your consent does not extend to any conflict that is not subject to waiver under applicable Rules of Professional Conduct (including Circular 230 discussed below), or to any matter that involves the assertion of a claim against the Village or the defense of a claim asserted by the Village. In addition, we agree that we will not use any confidential non-public information received from you in connection with this engagement to your material disadvantage in any matter in which we would be adverse to you.

Circular 230 as promulgated by the U.S. Department of Treasury (*"Circular 230"*) provides rules of professional conduct governing tax practitioners. Circular 230 includes provisions regarding conflicts of interest and related consents that in some respects are stricter than applicable state rules of professional conduct which otherwise apply. In particular, Circular 230 requires your consent to conflicts of interest be given in writing within 30 days of the date of this letter. If we have not received all of the required written consents by this date, we may be required under Circular 230 to "promptly withdraw from representation" of the Village in this matter.

Further, this engagement letter will also serve to give you express notice that we represent many other municipalities, school Villages, park Villages, counties, townships, special Villages and units of local government both within and outside of the State of Illinois and also the State itself and various of its agencies and authorities (collectively, the *"governmental units"*). Most but not all of these representations involve bond or other borrowing transactions. We have assumed that there are no controversies pending to which the Village is a party and is taking any position which is adverse to any other governmental unit, and you agree to advise us promptly if this assumption is incorrect. In such event, we will advise you if the other governmental unit is our client and, if so, determine what actions are appropriate. Such actions could include seeking waivers from both the Village and such other governmental unit or withdrawal from representation.

We anticipate that the Village will have its general or special counsel available as needed to provide advocacy in the Bond transaction and has had the opportunity to consult with such counsel concerning the conflict consents and other provisions of this letter; and that other Participants will retain such counsel as they deem necessary and appropriate to represent their interests.

D. OTHER TERMS OF THE ENGAGEMENT; CERTAIN OF YOUR UNDERTAKINGS

Please note our understanding with respect to this engagement and your role in connection with the issuance of the Bonds.

1. In rendering the Bond Opinion and in performing any other Services hereunder, we will rely upon the certified proceedings and other certifications you and other persons furnish us. Other than as we may determine as appropriate to rendering the Bond Opinion, we are not engaged and will not provide services intended to verify the truth or accuracy of these proceedings or certifications. We do not ordinarily attend meetings of the governing body of the Village at which proceedings related to the Bonds are discussed or passed unless special circumstances require our attendance.

2. The factual representations contained in those documents which are prepared by us, and the factual representations which may also be contained in any other documents that are furnished to us by you are essential for and provide the basis for our conclusions that there is compliance with State law requirements for the issue and sale of valid bonds and with the Federal tax law for the tax exemption of interest paid on the Bonds. Accordingly, it is important for you to read and understand the documents we provide to you because you will be confirming the truth, accuracy and completeness of matters contained in those documents at the issuance of the Bonds.

3. If the documents contain incorrect or incomplete factual statements, you must call those to our attention. We are always happy to discuss the content or meaning of the transaction documents with you. Any untruth, inaccuracy or incompleteness may have adverse consequences affecting either the tax exemption of interest paid on the Bonds or the adequacy of disclosures made in the Official Statement under the State and Federal securities laws, with resulting potential liability for you. During the course of this engagement, we will further assume and rely on you to provide us with complete and timely information on all developments pertaining to any aspect of the Bonds and their security. We understand that you will cooperate with us in this regard.

4. You should carefully review all of the representations you are making in the transaction documents. We are available and encourage you to consult with us for explanations as to what is intended in these documents. To the extent that the facts and representations stated in the documents we provide to you appear reasonable to us, and are not corrected by you, we are then relying upon your signed certifications for their truth, accuracy and completeness.

5. Issuing the Bonds as "securities" under State and Federal securities laws and on a tax-exempt basis is a serious undertaking. As the issuer of the Bonds, the Village is obligated under the State and Federal securities laws and the Federal tax laws to disclose all material facts. The Village's lawyers, financial advisers and bankers can assist the Village in fulfilling these duties, but the Village in its corporate capacity, including your knowledge, has the collective knowledge of the facts pertinent to the transaction and the ultimate responsibility for the presentation and disclosure of the relevant information. Further, there are complicated Federal tax rules applicable to tax-exempt bonds. The IRS has an active program to audit such transactions. The documents we prepare are designed so that the Bonds will comply with the applicable rules, but this means you must fully understand the documents, including the representations and the covenants relating to continuing compliance with the federal tax requirements. Accordingly, we want you to ask questions about anything in the documents that is unclear.

6. As noted, the members of the governing body of the Village also have duties under the State and Federal securities and tax laws with respect to these matters and should be knowledgeable as to the underlying factual basis for the bond issue size, use of proceeds and related matters.

7. We are also concerned about the adoption by the Village of the gift ban provisions of the State Officials and Employees Ethics Act, any special ethics or gift ban ordinance, resolution, bylaw or code provision, any lobbyist registration ordinance, resolution, bylaw or code provision or any special provision of law or ordinance, resolution, bylaw or code provision relating to disqualification of counsel for any reason. We are aware of the provisions of the State Officials and Employees Ethics Act and will assume that you are aware of these provisions as

well and that the Village has adopted proceedings that are only as restrictive as such Act. However, if the Village has stricter provisions than appear in such Act or has adopted such other special ethics or lobbyist provisions, we assume and are relying upon you to advise us of same.

E. FEES

As is customary, we will bill our fees as Bond Counsel on a transactional basis instead of hourly. Factors which affect our billing include: (a) the amount of the Bonds; (b) an estimate of the time necessary to do the work; (c) the complexity of the issue (number of parties, timetable, type of financing, legal issues and so forth); (d) recognition of the partially contingent nature of our fee, since it is customary that in the case no financing is ever completed, we render a greatly reduced statement of charges; and (e) a recognition that we carry the time for services rendered on our books until a financing is completed, rather than billing monthly or quarterly.

Our statement of charges is customarily rendered and paid at Closing, or in some instances upon or shortly after delivery of the bond transcripts; we generally do not submit any statement for fees prior to the Closing, except in instances where there is a substantial delay from the expected timetable. In such instances, we reserve the right to present an interim statement of charges. If, for any reason, the Bonds are not issued or are issued without the rendition of our Bond Opinion as bond counsel, or our services are otherwise terminated, we expect to negotiate with you a mutually agreeable compensation.

Lynda K. Given and the undersigned will be the attorneys primarily responsible for the firm's services on this Bond issue, with assistance as needed from other members of our bond, securities and tax departments.

F. RISK OF AUDIT BY INTERNAL REVENUE SERVICE

The IRS has an ongoing program of auditing tax-exempt obligations to determine whether, in the view of the IRS, interest on such tax-exempt obligations is excludable from gross income of the owners for federal income tax purposes. We can give no assurances as to whether the IRS might commence an audit of the Bonds or whether, in the event of an audit, the IRS would agree with our opinions. If an audit were to be commenced, the IRS may treat the Village as the taxpayer for purposes of the examination. As noted in Paragraph 7 of Part B above, the scope of our representation does not include responding to such an audit. However, if we were separately engaged at the time, and subject to the applicable rules of professional conduct, we may be able to represent the Village in the matter.

G. END OF ENGAGEMENT AND POST-ENGAGEMENT; RECORDS

Our representation of the Village and the attorney-client relationship created by this engagement letter will be concluded upon the issuance of the Bonds. Nevertheless, subsequent to the Closing, we will prepare and provide the Participants a bond transcript in a CD-ROM format pertaining to the Bonds and make certain that a Federal Information Reporting Form 8038-G is filed.

Please note that you are engaging us as special counsel to provide legal services in connection with a specific matter. After the engagement, changes may occur in the applicable laws or regulations, or interpretations of those laws or regulations by the courts or governmental agencies, that could have an impact on your future rights and liabilities. Unless you engage us specifically to provide additional services or advice on issues arising from this matter, we have no continuing obligation to advise you with respect to future legal developments.

This will be true even though as a matter of courtesy we may from time to time provide you with information or newsletters about current developments that we think may be of interest to you. While we would be pleased to represent you in the future pursuant to a new engagement agreement, courtesy communications about developments in the law and other matters of mutual interest are not indications that we have considered the individual circumstances that may affect your rights or have undertaken to represent you or provide legal services.

At your request, to be made at or prior to Closing, any other papers and property provided by the Village will be promptly returned to you upon receipt of payment for our outstanding fees and client disbursements. All other materials shall thereupon constitute our own files and property, and these materials, including lawyer work product pertaining to the transaction, will be retained or discarded by us at our sole discretion. You also agree with respect to any documents or information relating to our representation of you in any matter which have been lawfully disclosed to the public in any manner, such as by posting on EMMA, your website, newspaper publications, filings with a County Clerk or Recorder or with the Secretary of State, or otherwise, that we are permitted to make such documents or information available to other persons in our reasonable discretion. Such documents might include (without limitation) legal opinions, official statements, resolutions, or like documents as assembled and made public in a governmental securities offering.

We call your attention to the Village's own record keeping requirements as required by the IRS. Answers to frequently asked questions pertaining to those requirements can be found on the IRS' website under frequently asked questions related to tax-exempt bonds at www.irs.gov (click on "Tax Exempt Bond Community", then "Frequently Asked Questions"), and it will be your obligation to comply for at least as long as any of the Bonds (or any future bonds issued to refund the Bonds) are outstanding, plus three years.

H. YOUR SIGNATURE REQUIRED

If the foregoing terms are acceptable to you, please so indicate by returning the enclosed copy of this engagement letter dated and signed by an authorized officer not later than 30 days after the date of this letter, retaining the original for your files. Please note that if we perform Services prior to your executing this engagement letter, this engagement letter shall be effective as of the date we have begun rendering the Services. We will provide copies of this letter to certain of the Participants to provide them with an understanding of our role. We look forward to working with you.

Very truly yours,

CHAPMAN AND CUTLER LLP

By _____
Kyle W. Harding

Accepted and Approved:

VILLAGE OF NORTH AURORA, KANE COUNTY, ILLINOIS

By:_____

Title: _____

Date: _____, 2016

KWH:jmt
Enclosure

cc: Mr. Kevin McCanna

RESOLUTION NO._____
Resolution Approving an Engagement Letter with Speer Financial, Inc.

WHEREAS, the Village of North Aurora ("the Village") desires to undertake the process of issuing General Obligation Alternate Revenue Source bonds for the Waterworks System ("the bonds") for the purpose of financing certain waterworks system improvements; and

WHEREAS, the Village has determined that it is necessary to engage the services of a Municipal Advisor as part of the process; and

WHEREAS, the Village has utilized Speer Financial, Inc. in the past for prior bond issuances and bond refundings, and Speer Financial, Inc. is qualified and willing to serve as Municipal Advisor; and

WHEREAS, the Village entered into a Financial Services Agreement with Speer Financial, Inc in 2014; and

WHEREAS, Speer Financial, Inc. has provided the Village with a proposed Engagement Letter outlining the services to be performed in this matter and terms of service.

NOW, THEREFORE, be it resolved by the President and Board of Trustees of the Village of North Aurora, as follows:

1. The recitals set forth above are incorporated herein as the material findings of the President and the Board of Trustees.

2. The Agreement from Speer Financial, Inc. attached hereto and incorporated as Exhibit "A" is hereby approved.

3. The Village Finance Director and Village Administrator are hereby authorized and directed to enter into a formal Engagement Letter with Speer Financial, Inc. and proceed with the bond refunding process as provided for in the Agreement.

4. This Resolution shall take immediate full force and effect from and after its passage and approval.

Presented to the Board of Trustees of the Village of North Aurora, Kane County, Illinois this _____ day of _____, 2016, A.D.

Passed by the Board of Trustees of the Village of North Aurora, Kane County, Illinois this _____ day of _____, 2016, A.D.

Mark Guethle	_____	Laura Curtis	_____
Mark Gaffino	_____	Chris Faber	_____
Mark Carroll	_____	Michael Lowery	_____

Approved and signed by me as President of the Board of trustees of the Village of North Aurora, Kane County, Illinois this _____ day of _____, 2016 A.D.

_____
Village President Dale Berman

ATTEST:

_____
Village Clerk

Speer Financial, Inc.
INDEPENDENT MUNICIPAL ADVISORS
ESTABLISHED 1954

KEVIN McCANNA	DANIEL FORBES	DAVID PHILLIPS	RAPHALIATA McKENZIE	MAGGIE BURGER	ANTHONY MICELI	LARRY BURGER	BARBARA CHEVALIER	MARK JERETINA
Chairman	*President*	*Executive VP*	*Senior VP*	*Senior VP*	*Senior VP*	*Vice President*	*Vice President*	*Vice President*

October 3, 2016

Mr. Bill Hannah
Finance Director
Village of North Aurora
25 E. State St.
North Aurora, IL 60542

Re: Village of North Aurora, Kane County, Illinois
Issuance of General Obligation Bonds (Alternate Revenue Source), Series 2017

Dear Bill:

Speer Financial, Inc. ("Speer") is pleased to provide this Engagement Letter to the Village of North Aurora, Kane County, Illinois (the "Client") for our services as Municipal Advisor in connection with the issuance of the securities referenced above (the "Bonds"). The purpose of the issuance of the Bonds, briefly stated, is to provide for capital projects related to the Village's waterworks system (the "Project").

Speer is providing this Engagement Letter to you to memorialize the terms of our engagement (the "Engagement") as your Municipal Advisor with respect to the Project. This Engagement Letter is required under current Federal securities law and serves to provide certain additional information to the Client, such as disclosures of services, fees, terms and termination, conflict of interest and any material disciplinary actions.

Services. Speer agrees to provide to the Client the municipal advisory services (the "Services") set forth in the attached **Exhibit A**. Certain limitations to Speer's Services are set forth in the attached **Exhibit B**. The Client, as an issuer of municipal securities, is also subject to certain other terms as it relates to the issuance of securities and Speer's Engagement. These terms are detailed in the attached **Exhibit C**.

Authorization. It is Speer's understanding that the Finance Director of the Client (the "Client Contact") is authorized to receive this Engagement Letter and discuss with Speer the terms and disclosures of this Engagement Letter. Speer may also rely on the authority of such Client Contact when receiving direction from such Client Contact in the course of Speer providing its Services.

Term and Termination. Speer's Engagement shall remain in effect until terminated by the Client or Speer upon at least thirty (30) days written notice to the other party. If the Client terminates the Engagement prior to the issuance of the Bonds, Speer expects to negotiate with the Client a mutually agreeable compensation for the Services provided by Speer prior to such termination.

Compensation. Speer's compensation for Services on the Bonds is set forth below.

As compensation for Speer's provision of the Services, Speer shall receive a fee based upon the par amount of the Bonds issued, calculated as follows:

Financial Advisory Services:	$6,000 plus 1/4 of 1% of the municipal securities issued in excess of $2,000,000.

This fee is the same regardless of the method of sale of the Bonds and is contingent on the sale of the Bonds.

This fee does not include the payment of Speer's out-of-pocket costs as further described in **Exhibit B.** See the attached **Exhibit D** for a description of the conflicts of interest in connection with each form of compensation.

Representations of Client. The factual representations contained in the documents which are prepared by Speer in the course of its Engagement, and the factual representations which may also be contained in any other documents that are furnished to Speer by the Client, are essential for and provide the basis for Speer's municipal advice. Accordingly, it is important for the Client to read and understand the documents Speer provides to the Client because the Client will be confirming the truth, accuracy and completeness of matters contained in those documents. Speer's Engagement does not include the verification of the truth or accuracy of such factual representations, as further described in the attached **Exhibit C**.

Required Disclosures. MSRB Rule G-42 requires that Speer provide the Client with disclosures of material conflicts of interest and information regarding certain legal events and disciplinary history. Such disclosures are provided in the attached **Exhibit D**. Should the Client have any questions or concerns with this disclosure, the Client should promptly contact Speer.

Risk Disclosure. Each form of financing has particular financial characteristics and inherent risks. Provided in the attached **Exhibit E** is a general description of the most commonly used security structures of fixed rate municipal bonds in Illinois as well disclosures on the risks of each structure known to Speer at this time. Should the Client have any questions or concerns with this disclosure, the Client should promptly contact Speer.

We sincerely appreciate this opportunity to be of service, and look forward to working with you.

Sincerely,

SPEER FINANCIAL, INC.

By: Kim W. McCanna

Its: Chairman of the Board

Telephone: 312-780-2279
Email: kmccanna@speerfinancial.com

EXHIBIT A

SPEER FINANCIAL, INC. MUNICIPAL ADVISOR SERVICES FOR
Village of North Aurora, Illinois

Financial Planning Services

1. *Orientation:* Reviewing the Client's current financial position, statutory authority, and financing capabilities, including whether a refunding or defeasance of any outstanding debt is appropriate.

2. *Coordination*: Coordinating financial planning and issuance details with the Client's staff, bond counsel, paying agents, rating agencies and other transaction participants.

3. *Consultation*: Consulting with the elected and key appointed officials and staff regarding the various phases of the development and implementation of a financing plan.

4. *Public Relations*: Responding to inquiries from the general public or news media relating to municipal issuance related matters.

5. *Planning*: Developing a debt financing plan that includes all or some of the following:

    a. Maturity Schedules - Alternative maturity schedules relating to the financing. These schedules may "wrap" around existing debt to provide stable tax rates, level debt service payments, or meet other policy or cash flow requirements as may be requested by the Client.

    b. Market Receptivity - An evaluation of potential market receptivity for each debt issuance and recommend the most suitable sale option.

    c. Tax Law - Consultation with bond counsel as to the ramifications of Federal tax law on the financing plan.

    d. Credit Rating and/or Insurance - A costs and benefits analysis regarding whether to obtain any available credit enhancements and/or a credit ratings.

    e. Competitive and Negotiated Sale of Debt Securities - An analysis and corresponding recommendation regarding the method of sale to be used in connection with the financing plan.

    f. Financing Timeline - A tentative financing timeline to guide officials regarding the timing of various aspects of the financing plan.

Competitive Sale Services

1. *Authorizing Resolutions/Ordinances* - Assist the Client's attorney and/or bond counsel with regard to the financial provisions to be included within the Client's authorizing resolutions/ordinances relative to the securities issuance.

2. *Credit Rating and/or Insurance* - When applying for a credit rating and/or bond insurance, Speer will submit the necessary data and documents to the selected rating agency(ies) and/or insurance company(ies).

3. *Disclosure Document, Notice of Sale and Bid Form:*

a. Preparation of Documents - Prepare a preliminary Official Statement, Term Sheet, Statement of Facts or Limited Offering Memorandum (each a "Disclosure Document"), Notice of Sale and Bid Form. Following the award of the securities, Speer shall prepare the final Disclosure Document corresponding to the Project. The Disclosure Document will describe the securities being issued and will contain detailed information provided by the Client and bond counsel.

b. Notice of Sale Publication - Notify certain prospective purchasers of the sale and prepare, as necessary, a Notice of Sale.

c. Encouragement to Bidders - Circulate the preliminary Disclosure Document to certain potential purchasers, including as appropriate, investment institutions, banks and underwriters, to solicit bids from such firms for the Client's securities. Provide copies of the preliminary Disclosure Document and Official Bid Forms, as applicable, for each sale to the Client for distribution to local banks and elected officials.

d. Bid Opening, Analysis and Recommendations - Conduct each sale, examine the bids submitted for completeness and compliance with the applicable bidding requirements, evaluate the bids for accuracy, and recommend a proposed course of action relative thereto.

4. *Preparation, Registration and Delivery of Securities* - Conduct all necessary undertakings in order to complete the financing, including monitoring the preparation, registration and delivery of the securities being issued.

5. *Debt Service Schedule* - Provide the Client with a final debt service schedule and other financial materials pertinent to the securities sale.

Negotiated Sale Services

1. *Authorizing Resolutions/Ordinances* - Assist the Client's attorney and/or bond counsel with regard to the financial provisions to be included within the Client's authorizing resolutions/ordinances relative to the securities issuance.

2. *Credit Rating and/or Insurance* - When applying for a credit rating and/or bond insurance Speer will submit the necessary data and documents to the selected credit rating agency(ies) and/or insurance company(ies).

3. *Disclosure Document and Proposals*:

a. Preparation of Documents - Prepare or assist in the preparation of a preliminary Disclosure Document, Request for Proposals (RFP) or Request for Qualifications (RFQ) if requested by the Client, and, following the award of the securities, the final Disclosure Document.

b. Proposal Analysis and Recommendations - Review and examine any proposals submitted for completeness and compliance with the applicable RFP/RFQ requirements, evaluate the proposals for accuracy, and recommend a proposed course of action relative to the proposals received.

4. *Negotiation of Terms* - Negotiate with the selected underwriter(s)/purchaser(s) relative to interest rates, terms and conditions of the securities issuance.

5. *Preparation, Registration and Delivery of Securities* - Conduct all necessary undertakings in order to complete the financing, including, monitoring the preparation, registration and delivery of the securities being issued.

6. *Debt Service Schedule* - Provide the Client with a final debt service schedule and other financial materials pertinent to the securities sale.

Private Placement Services

1. *Authorizing Resolutions/Ordinances* - Assist the Client's attorney and/or bond counsel with regard to the financial provisions to be included within the Client's authorizing resolutions/ordinances relative to the securities issuance.

2. *Disclosure Document and Proposals:*

c. Preparation of Documents - Prepare or assist in the preparation of a preliminary Disclosure Document, Request for Proposals (RFP) or Request for Qualifications (RFQ) if requested by the Client, and, following the award of the securities, the final Disclosure Document.

d. Proposal Analysis and Recommendations - Review and examine any proposals submitted for completeness and compliance with the applicable RFP/RFQ requirements, evaluate the proposals for accuracy, and recommend a proposed course of action relative to the proposals received.

3. *Advise on Financing Terms* – Advise the client on the terms of the financing including the interest rate offered and the covenants required by the intended purchaser.

4. *Preparation, Registration and Delivery of Securities* - Conduct all necessary undertakings in order to complete the financing, including, monitoring the preparation, registration and delivery of the securities being issued.

5. *Debt Service Schedule* - Provide the Client with a final debt service schedule and other financial materials pertinent to the securities sale.

With respect to all private placement Services, Speer will always serve as municipal advisor to the Client and as such will not specifically identify investors/purchasers in a securities offering or negotiate specific terms with the investor/purchaser of the Client's securities. Speer will not negotiate terms to directly place an issuance of securities with an investor. Any investors contacted or solicited will be identified by the Client and contacted on behalf of the Client.

EXHIBIT B

LIMITATIONS TO SPEER'S MUNICIPAL ADVISOR SERVICES

Speer's duties as Municipal Advisor are limited to the Services detailed in **Exhibit A.** Among other things, Speer's Engagement does not include:

1. Giving any advice, opinion or representation as to the fiscal prudence or policy priority of issuing the securities or any other aspect of the securities transaction, including, without limitation, the undertaking of any project to be financed with the proceeds of the securities, as those are the Client's policy decisions.

2. Giving any opinion or advice on the legality of the securities or the tax status of the securities.

3. Preparing any of the following: requests for tax rulings from the Internal Revenue Service, blue sky or investment surveys with respect to the securities, state legislative amendments, or pursuing test cases or other litigation.

4. Undertaking rebate calculations for the securities or anything related to monitoring investments of securities proceeds or expenditure of securities proceeds, as that is a specialty service provided by others when appropriate.

5. Participating in the underwriting of the debt, as prohibited by Federal securities law.

6. Monitoring the actual use of proceeds, the timely expenditure of proceeds and the project completion status.

7. Verifying the accuracy of audited and unaudited financial statements.

8. Giving advice on the investment of securities proceeds.

9. Monitoring ongoing obligations and covenants entered into by the Client with respect to the securities, as these tasks are performed by the Client.

10. The Services do not include the payment by Speer of its "out of pocket" expenses, including but not limited to, the utilization of a bidding platform (*SpeerAuction* or *SpeerBids*), verification services as requested by the Client, mailing, overnight and messenger delivery and printing and copying costs.

11. Filing material events notices or otherwise assisting the Client with its continuing disclosure obligations, as such assistance is to be provided under a separate written agreement. Nothing in this Engagement Letter obligates Speer to provide, or the Client to pay for, any such continuing disclosure services.

EXHIBIT C

OTHER TERMS OF THE SPEER ENGAGEMENT

Please note the following with respect to the Client's role in connection with each issuance of securities.

1. It is important for the Client to read and understand the documents Speer provides to the Client because the Client will be confirming the truth, accuracy and completeness of matters contained in those documents at the issuance of the securities. If the documents contain incorrect or incomplete factual statements, the Client must call those to Speer's attention. Speer will not perform an independent investigation or verification to determine the accuracy, completeness or sufficiency of any such document or render any advice, view or comfort that the Disclosure Document or other disclosure document does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements contained therein, in light of the circumstances under which they were made, not misleading. Any information in such documents does not constitute a review, audit or certified forecast of future events and any such financial information may not conform to accounting principles applicable to compilations of financial information. Any untruth, inaccuracy or incompleteness may have adverse consequences affecting either the tax exemption of interest paid on the securities or the adequacy of disclosures made in the Disclosure Document under State and Federal securities laws, with resulting potential liability for the Client. During the course of its Engagement, Speer will assume and rely on the Client to provide Speer with complete and timely information on all developments pertaining to any aspect of the securities and their security. Speer understands that the Client will cooperate with Speer in this regard.

2. To the extent that during the course of Speer's advising the Client a relevant matter comes to Speer's attention which appears to be contrary to what is contained in the transaction documents including any representations in the transaction documents or in the Disclosure Document, Speer may ask the Client about such apparent divergence of the facts; but to the extent that the facts and representations stated in the documents Speer provides to the Client, and are not corrected by the Client, Speer is then relying upon the Client's signed certifications for their truth, accuracy and completeness.

3. Issuing the securities as "securities" under State and Federal securities laws and on a tax-exempt basis is a serious undertaking. As the issuer of the securities, the Client is obligated under that State and Federal securities laws and the Federal tax laws to disclose all material facts. The Client has a duty to exercise "due diligence" in determining the accuracy and completeness of the information used in the Disclosure Document and the information upon which legal opinions related to the securities are based. The Client's lawyers, accountants and advisors can assist the Client in fulfilling these duties, but the Client in its corporate capacity, including the Client's knowledge, has the collective knowledge of the facts pertinent to the transaction and the ultimate responsibility for the presentation and disclosure of the relevant information.

4. Requirements of issuing debt include that the Client is current in its annual continuing disclosure obligations, including material events notices, and current in its arbitrage rebate obligations. These requirements are the obligation of the Client and not of Speer or bond counsel.

EXHIBIT D

REQUIRED DISCLOSURES

1. DISCLOSURE OF CONFLICTS OF INTEREST

A. Various Forms of Compensation

The Municipal Securities Rulemaking Board (MSRB) requires us, as your municipal advisor, to provide written disclosure to you about the actual or potential conflicts of interest presented by various forms of compensation. We must provide this disclosure unless you have required that a particular form of compensation be used. You should select a form of compensation that best meets your needs and the agreed upon scope of services.

The forms of compensation for municipal advisors vary according to the nature of the engagement and requirements of the Client, among other factors. Various forms of compensation present actual or potential conflicts of interest because they may create an incentive for an advisor to recommend one course of action over another if it is more beneficial to the advisor to do so. This document discusses various forms of compensation and the timing of payments to the advisor.

Fixed fee. Under a fixed fee form of compensation, the municipal advisor is paid a fixed amount established at the outset of the transaction. The amount is usually based upon an analysis by the Client and the advisor of, among other things, the expected duration and complexity of the transaction and the agreed-upon scope of work that the advisor will perform. This form of compensation presents a potential conflict of interest because, if the transaction requires more work than originally contemplated, the advisor may suffer a loss. Thus, the advisor may recommend less time-consuming alternatives, or fail to do a thorough analysis of alternatives. There may be additional conflicts of interest if the municipal advisor's fee is contingent upon the successful completion of a financing, as described below.

Hourly fee. Under an hourly fee form of compensation, the municipal advisor is paid an amount equal to the number of hours worked by the advisor times an agreed-upon hourly billing rate. This form of compensation presents a potential conflict of interest if the Client and the advisor do not agree on a reasonable maximum amount at the outset of the engagement, because the advisor does not have a financial incentive to recommend alternatives that would result in fewer hours worked. In some cases, an hourly fee may be applied against a retainer (*e.g.*, a retainer payable monthly), in which case it is payable whether or not a financing closes. Alternatively, it may be contingent upon the successful completion of a financing, in which case there may be additional conflicts of interest, as described below.

Fee contingent upon the completion of a financing or other transaction. Under a contingent fee form of compensation, payment of an advisor's fee is dependent upon the successful completion of a financing or other transaction. Although this form of compensation may be customary for the Client, it presents a conflict because the advisor may have an incentive to recommend unnecessary financings or financings that are disadvantageous to the Client. For example, when facts or circumstances arise that could cause the financing or other transaction to be delayed or fail to close, an advisor may have an incentive to discourage a full consideration of such facts and circumstances, or to discourage consideration of alternatives that may result in the cancellation of the financing or other transaction.

Fee paid under a retainer agreement. Under a retainer agreement, fees are paid to a municipal advisor periodically (*e.g.*, monthly) and are not contingent upon the completion of a financing or other transaction. Fees paid under a retainer agreement may be calculated on a fixed fee basis (*e.g.*, a fixed fee per month regardless of the number of hours worked) or an hourly basis (*e.g.*, a minimum monthly payment, with additional amounts payable if a certain number of hours worked is exceeded). A retainer agreement does not present the conflicts

associated with a contingent fee arrangement (described above).

Fee based upon principal or notional amount and term of transaction. Under this form of compensation, the municipal advisor's fee is based upon a percentage of the principal amount of an issue of securities (*e.g.*, bonds) or, in the case of a derivative, the present value of or notional amount and term of the derivative. This form of compensation presents a conflict of interest because the advisor may have an incentive to advise the Client to increase the size of the securities issue or modify the derivative for the purpose of increasing the advisor's compensation.

B. Other Material Conflicts of Interest

The MSRB requires us, as your municipal advisor, to provide written disclosure to you about material conflicts of interest. The following represent Speer material conflicts of interest known to Speer as of the date of this Representation Letter.

As of the date of this Engagement, Speer is unaware of any material conflicts of interest.

2. DISCLOSURE OF LEGAL EVENTS AND DISCIPLINARY ACTION

The MSRB requires us, as your municipal advisor, to provide written disclosure to you of any legal or disciplinary events material to your evaluation of Speer or the integrity of Speer's management or advisory personnel.

Material Legal or Disciplinary Event. There are no legal or disciplinary events that are material to the Client's evaluation of Speer or the integrity of Speer's management or advisory personnel disclosed, or that should be disclosed, on any Form MA or Form MA-I filed with the SEC.

How to Access Form MA and Form MA-I Filings. Speer's most recent form MA and each most recent Form MA-I filed with the SEC are available on the SEC's EDGAR system at:

http://www.sec.gov/cgi-bin/browse-edgar?action=getcompany&CIK=0001606944

Most Recent Change in Legal or Disciplinary Event Disclosure. Speer has not made any material legal or disciplinary event disclosures on Form MA or any Form MA-I filed with the SEC.

3. FUTURE DISCLOSURES

As required by MSRB Rule G-42, the Required Disclosures found in this Exhibit D may be supplemented or amended, from time to time as needed, to reflect changed circumstances resulting in new conflicts of interest or changes in conflicts of interest described above, or to provide updated information with regard to any legal or disciplinary events of Speer. Speer will provide the Client with any such supplemental or amended information as it becomes available through the term of the Municipal Advisory Relationship.

EXHIBIT E

FINANCIAL CHARACTERISTICS AND RISKS OF MUNICIPAL BONDS IN ILLINOIS

The following is a general description of the financial characteristics, security structures and risks of municipal fixed rate bonds ("Municipal Bonds") issued in Illinois. The risks being disclosed in this Exhibit E are those that are known to Speer at this time and should be considered by the Client prior to deciding whether to issue Municipal Bonds. If you have any questions or concerns about any disclosure made, please notify Speer immediately.

Financial Characteristics

Maturity and Interest. Municipal Bonds are interest-bearing debt securities issued by state and local governments, political subdivisions and agencies and authorities. Maturity dates for Municipal Bonds are fixed at the time of issuance and may include serial maturities (specified principal amounts are payable on the same date in each year until final maturity) or one or more term maturities (specified principal amounts are payable on each term maturity date) or a combination of serial and term maturities. The final maturity date typically will range between 10 and 30 years from the date of issuance. Interest on the Municipal Bonds typically is paid semiannually at a stated fixed rate or rates for each maturity date.

Redemption. Municipal Bonds may be subject to optional redemption, which allows you, at your option, to redeem some or all of the bonds on a date prior to scheduled maturity, such as in connection with the issuance of refunding bonds to take advantage of lower interest rates. Municipal Bonds will be subject to optional redemption only after the passage of a specified period of time, often approximately ten years from the date of issuance, and upon payment of the redemption price set forth in the bonds, which may include a redemption premium. You will be required to send out a notice of optional redemption to the holders of the bonds, usually not less than 30 days prior to the redemption date. Municipal Bonds with term maturity dates also may be subject to mandatory sinking fund redemption, which requires you to redeem specified principal amounts of the bonds annually in advance of the term maturity date. The mandatory sinking fund redemption price is 100% of the principal amount of the bonds to be redeemed.

Security

Payment of principal of and interest on a municipal security, including Municipal Bonds, may be backed by various types of pledges and forms of security, some of which are described below. The description below regarding "Security" is only a brief summary of certain possible security provisions for the bonds and is not intended as legal advice. You should consult with your bond counsel for further information regarding the security for the bonds.

General Obligation Bonds. "General obligation bonds" are debt securities to which your full faith and credit is pledged to pay principal and interest. If you have taxing power, generally you will pledge to use your ad valorem (property) taxing power to pay principal and interest. All taxable property in the taxing body is subject to the levy of taxes to pay the same without limitation as to rate or amount. The term "limited" tax is used when a limit exists as to the amount of the tax (see below). General obligation bonds constitute a debt and, depending on applicable state law, may require that you obtain approval by voters prior to issuance. In the event of default in required payments of interest or

principal, the holders of general obligation bonds have certain rights under state law to compel you to impose a tax levy.

Limited Bonds. Taxing bodies, subject to the Property Tax Extension Limitation Law of the State of Illinois, as amended (the *"Extension Limitation Law"),* can issue limited bonds. Limited bonds are issued in lieu of general obligation bonds that otherwise have been authorized by applicable law. They are payable from a separate property tax levy that is unlimited as to rate, but the amount of taxes that will be extended to pay the bonds is limited by the Extension Limitation Law. Limited bonds are payable from your debt service extension base *(the "Base"),* which is an amount equal to that portion of the extension for the applicable levy year for the payment of non-referendum bonds (other than alternate bonds or refunding bonds issued to refund bonds initially issued pursuant to referendum), increased each year, beginning with the 2009 levy year, by the lesser of 5% or the percentage in the Consumer Price Index for All Urban Consumers (as defined in the Extension Limitation Law) during the 12-month calendar year preceding the levy year. The Limitation Law further provides that the annual amount of taxes to be extended to pay the limited bonds and all other limited bonds heretofore and hereafter issued by you shall not exceed the Base less the amount extended to pay certain other non-referendum bonds heretofore and hereafter issued by you and bonds issued to refund such bonds.

Limited bonds constitute a debt. In the event of default in required payments of interest or principal, the holders of limited bonds have certain rights under state law to compel you to impose a tax levy (limited as set forth in the previous paragraph).

Alternate Bonds. Section 15 of the Local Government Debt Reform Act of the State of Illinois, as amended (the *"Debt Reform Act"),* permits you to issue alternate or "double-barrelled" bonds. Alternate bonds are general obligation bonds payable from enterprise revenues or from a revenue source, or both, with your general obligation acting as backup security for the bonds. Once issued, and until paid or defeased, alternate bonds are a general obligation, for the payment of which you pledge your full faith and credit. Such bonds are payable from the levy of ad valorem property taxes upon all taxable property in your taxing body without limitation as to rate or amount. The intent of the Debt Reform Act is for the enterprise revenues or the revenue source to be sufficient to pay the debt service on the alternate bonds so that taxes need not be levied, or, if levied, need not be extended, for such payment.

The Debt Reform Act prescribes several conditions that must be met before alternate bonds may be issued. First, alternate bonds must be issued for a lawful corporate purpose. If issued in lieu of revenue bonds (as described below), then the revenue bonds must have been authorized under applicable law (including satisfying any backdoor referendum requirements) and the alternate bonds must be issued for the purpose for which the revenue bonds were authorized. If issued payable from a revenue source limited in its purposes or applications, then the alternate bonds must be issued only for such limited purposes or applications.

Second, alternate bonds are subject to a backdoor referendum. The issuance of alternate bonds must be submitted to referendum if, within 30 days after publication of the authorizing ordinance and notice of intent to issue the alternate bonds, a petition is filed. The petition must be signed by the greater of (i) 7.5% of your registered voters or (ii) the lesser of 200 of the registered voters or 15% of the registered voters, asking that the issuance of the alternate bonds be submitted to referendum. Backdoor referendum proceedings for revenue bonds and for alternate bonds to be issued in lieu of revenue bonds may be conducted at the same time.
Notwithstanding the previous paragraph, in governmental units with fewer than 500,000 inhabitants that propose to issue alternate bonds payable solely from enterprise revenues, except for alternate bonds that

finance or refinance projects concerning public utilities, public streets and roads or public safety facilities and related infrastructure and equipment, if no petition is filed within 45 days of publication of the authorizing ordinance and notice, the alternate bonds may be issued. For purposes of this paragraph, the required number of petitioners for a governmental unit with more than 4,000 registered voters is the lesser of (i) 5% of the registered voters or (ii) 5,000 registered voters and the required number of petitioners for a governmental unit with 4,000 or fewer registered voters is the lesser of (i) 15% of the registered voters or (ii) 200 registered voters.

Third, you must demonstrate that the enterprise revenues are, or that the revenue source is, sufficient to meet the requirements of the Debt Reform Act. If enterprise revenues are pledged as security for the alternate bonds, you must demonstrate that such revenues are sufficient in each year to pay all of the following:

(a) costs of operation and maintenance of the utility or enterprise, excluding depreciation;

(b) debt service on all outstanding revenue bonds payable from such enterprise revenues;

(c) all amounts required to meet any fund or account requirements with respect to such outstanding revenue bonds;

(d) other contractual or tort liability obligations, if any, payable from such enterprise revenues; and

(e) in each year, an amount not less than 1.25 times debt service on all:

(i) outstanding alternate bonds payable from such enterprise revenues; and

(ii) the alternate bonds proposed to be issued.

If one or more revenue sources are pledged as security for the alternate bonds, you must demonstrate that such revenue sources are sufficient in each year to provide not less than 1.25 times (1.10 times if the revenue source is a government revenue source) debt service on all outstanding alternate bonds payable from such revenue source and on the alternate bonds proposed to be issued. You need not meet the test described in this paragraph for the amount of debt service set aside at closing from bond proceeds or other moneys.

The determination of the sufficiency of enterprise revenues or revenue source or sources, as applicable, must be supported by reference to the most recent audit of the governmental unit, which must be for a fiscal year ending on a date that is not more than 18 months prior to the date of issuance of the alternate bonds. If such audit does not adequately show such enterprise revenues or revenue source, as applicable, or if such enterprise revenues or revenue source, as applicable, are shown to be insufficient, then the determination of sufficiency must be supported by the report of an independent accountant or feasibility analyst, the latter having a national reputation for expertise in such matters, who is not otherwise involved in the project being financed or refinanced with the proceeds of the alternate bonds, demonstrating the sufficiency of such revenues and explaining, if appropriate, by what means the revenues will be greater than as shown in the audit.

Alternate bonds may be issued to refund alternate bonds without meeting any of the conditions set forth above if the term of the refunding bonds is not longer than the term of the refunded bonds and that the

debt service payable in any year on the refunding bonds does not exceed the debt service payable in such year on the refunded bonds.

Alternate bonds are not regarded or included in any computation of indebtedness for the purpose of any statutory provision or limitation unless taxes, other than a designated revenue source, are extended to pay the bonds. In the event taxes are extended, the amount of alternate bonds then outstanding counts against your debt limit until your audit shows that the alternate bonds have been paid from the pledged enterprise revenues or revenue source for a complete fiscal year.

In the event of default in required payments of interest or principal, the holders of alternate bonds have certain rights under state law to compel you to increase the pledged revenues or have the tax levy extended for such payment.

Debt Certificates. You may issue "debt certificates" to evidence your payment obligation under an installment contract or lease. Your governing body may provide for the treasurer, comptroller, finance officer or other officer of the governing body charged with financial administration to act as counterparty to the installment contract or lease, as nominee- seller or lessor. The installment contract or lease is then executed by your authorized officer and is filed with and executed by the nominee-seller or lessor. As contracts for the acquisition and construction of the project to be financed are executed (the "Work Contracts"), the governing body orders those Work Contracts to be filed with the nominee-seller or lessor. The nominee- seller or lessor identifies the Work Contracts to the particular installment contract or lease. Such identification permits the payment of the Work Contracts from the proceeds of the debt certificates.

Debt certificates are paid from your lawfully available funds. You are expected to agree to annually budget/appropriate amounts to pay the principal of and interest on the debt certificates. There is no separate levy available for the purpose of making such payments.

Debt certificates constitute a debt. In the event of default in required payments of interest or principal, the holders of the debt certificates cannot compel you to impose a tax levy, but you have promised the holders of the debt certificates that you will pay the debt certificates and they can proceed to file suit to enforce such promise.

Special Service Area Bonds. When special services are provided to a particular contiguous area within a municipality, in addition to the services generally provided throughout the municipality, a municipality may create a special service area. The cost of the special services may be paid from taxes levied upon the taxable real property within the area, and such taxes may be levied in the special service area at a rate or amount sufficient to produce revenues required to provide the special services.

Prior to the first levy of taxes in the special service area and prior to or within 60 days after the adoption of the ordinance proposing the establishment of the special service area, you are required to hold a public hearing and to publish and mail notice of such hearing. At the public hearing, any interested person may file written objections or give oral statements with respect to the establishment of the special service area and the levy of taxes therein. As a result of the hearing, you may delete areas from the special service area as long as the remaining area is contiguous. After the hearing, an ordinance establishing the special service area must be timely filed with the county recorder and the county clerk.

Bonds secured by the full faith and credit of the special service area territory may be issued for the purpose of providing special services. Such bonds are paid from the levy of taxes unlimited as to rate or amount against the taxable real property in the special service area. The county clerk will annually extend taxes against all of the taxable real property in the area in amounts sufficient to pay the principal and interest on the bonds. Such bonds are exempt from the Extension Limitation Law of the State of Illinois, as amended.

Prior to the issuance of special service area bonds, you must give published and mailed notice and hold a hearing at which any interested person may file written objections, or be heard orally, with respect to the issuance of the bonds. The questions of the creation of the special service area, the levy of a tax on such area and the issuance of special service area bonds may all be considered at the same hearing.

The creation of the special service area, the levy of a tax within the area and the issuance of bonds for the provision of special services to the area are subject to a petition process. If, within 60 days after the public hearing, a petition signed by not less than 51% of the electors residing within the special service area and 51% of the owners of record of land located within the special service area is filed with the municipal clerk objecting to the creation of the special service area, the levy of a tax or the issuance of bonds, then the area may not be created, the tax may not be levied and the bonds may not be issued. If such a petition is filed, the subject matter of the petition may not be proposed relative to any of the signatories within the next two years.

Special service area bonds do not constitute an indebtedness of the municipality, and no exercise of your taxing power may be compelled on behalf of the special service area bondholders other than the ad valorem property taxes to be extended on the taxable real property in the special service area.

Revenue Bonds. "Revenue bonds" are debt securities that are payable only from a specific source or sources of revenues. Revenue bonds are not a pledge of your full faith and credit and you are obligated to pay principal and interest on your revenue bonds only from the revenue source(s) specifically pledged to the bonds. Revenue bonds do not permit the bondholders to compel you to impose a tax levy for payment of debt service. Pledged revenues may be derived from operation of the financed project or system, grants or excise or other specified taxes. Generally, subject to state law or local charter requirements, you are not required to obtain voter approval prior to issuance of revenue bonds. Revenue bonds may, however, be subject to a backdoor referendum. If the specified source(s) of revenue become inadequate, a default in payment of principal or interest may occur. Various types of pledges of revenue may be used to secure interest and principal payments on revenue bonds. The nature of these pledges may differ widely based on state law, the type of issuer, the type of revenue stream and other factors.

Some revenue bonds, referred to as conduit revenue bonds, may be issued by a governmental issuer acting as conduit for the benefit of a private sector entity or a 50l(c)(3) organization (the obligor). Conduit revenue bonds commonly are issued for not-for-profit hospitals, educational institutions, single and multi-family housing, airports, industrial or economic development projects, and student loan programs, among other obligors. Principal and interest on conduit revenue bonds normally are paid exclusively from revenues pledged by the obligor.

Unless otherwise specified under the terms of the bonds, you are not required to make payments of principal or interest if the obligor defaults.

Tax Increment Financing. Tax increment financing provides a means for municipalities, after the approval of a "redevelopment plan and project," to redevelop blighted, conservation or industrial park conservation areas. The Tax Increment Allocation Redevelopment Act of the State of Illinois, as amended, allows incremental property taxes to be used to pay certain redevelopment project costs and to pay debt service with respect to tax increment bonds issued to pay redevelopment project costs. The municipality is authorized to issue tax increment bonds payable from, and secured by, incremental property tax revenues expected to be generated in the redevelopment project area. Incremental property tax revenues are derived from the increase in the current equalized assessed valuation of the real property within the redevelopment project area over and above the certified initial equalized assessed valuation for such redevelopment project area.

Before adopting the necessary ordinances to designate a redevelopment project area, a municipality must hold a public hearing and convene a joint review board to consider the proposal. At the public hearing, any interested person or taxing district may file written objections and may give oral statements with respect to the proposed financing. After the municipality has considered all comments made by the public and the joint review board, it may adopt the necessary ordinances to designate a redevelopment project area.

Tax increment bonds may be secured by the full faith and credit of the municipality. The issuance of general obligation tax increment bonds is subject to a "backdoor," rather than a direct, referendum. Once a municipality has authorized the issuance of tax increment obligations secured by its full faith and credit, the ordinance authorizing the issuance must be published in a newspaper of general circulation in the municipality. In response, voters may petition to request that the question of issuing obligations using the full faith and credit of the municipality as security to pay for redevelopment project costs be submitted to the electors of the municipality. If, within 30 days after the publication, l0% of the registered voters of the municipality sign such a petition, the question of whether to issue tax increment bonds secured by the municipality's full faith and credit must be approved by the voters pursuant to referendum. Such bonds are not exempt from the Extension Limitation Law unless first approved at referendum.

Tax increment revenues may also be treated as a "revenue source" and be pledged to the payment of alternate bonds under Section 15 of the Debt Reform Act.

Risk Considerations

Certain risks may arise in connection with your issuance of Municipal Bonds, including some or all of the following (generally, the obligor, rather than you, will bear these risks for conduit revenue bonds):

Issuer Default Risk. You may be in default if the funds pledged to secure your bonds are not sufficient to pay debt service on the bonds when due. The consequences of a default may be serious for you and, depending on applicable state law and the terms of the authorizing documents, the holders of the bonds, the trustee and any credit support provider may be able to exercise a range of available remedies against you. For example, if the bonds are secured by a general obligation pledge, you may be ordered by a court to raise taxes. Other budgetary adjustments also may be necessary to enable you to provide sufficient funds to pay debt service on the bonds. If the bonds are revenue bonds or alternate bonds, you may be required to take steps to increase the available revenues that are pledged as security for the bonds. A default may negatively impact your credit ratings and may effectively limit your ability to publicly offer bonds or other securities at market interest rate levels. Further, if you are unable to provide sufficient funds to remedy the default, subject to applicable state law and the terms of the

authorizing documents, you may find it necessary to consider available alternatives under state law, including (for some issuers) state-mandated receivership or bankruptcy. A default also may occur if you are unable to comply with covenants or other provisions agreed to in connection with the issuance of the bonds.

This description is only a brief summary of issues relating to defaults and is not intended as legal advice. You should consult with your bond counsel for further information regarding defaults and remedies.

Redemption Risk. Your ability to redeem the bonds prior to maturity may be limited, depending on the terms of any optional redemption provisions. In the event that interest rates decline, you may be unable to take advantage of the lower interest rates to reduce debt service.

Refinancing Risk. If your financing plan contemplates refinancing some or all of the bonds at maturity (for example, if you have term maturities or if you choose a shorter final maturity than might otherwise be permitted under the applicable federal tax rules), market conditions or changes in law may limit or prevent you from refinancing those bonds when required. Further, limitations in the federal tax rules on advance refunding of bonds (an advance refunding of bonds occurs when tax-exempt bonds are refunded more than 90 days prior to the date on which those bonds may be retired) may restrict your ability to refund the bonds to take advantage of lower interest rates.

Reinvestment Risk. You may have proceeds of the bonds to invest prior to the time that you are able to spend those proceeds for the authorized purpose. Depending on market conditions, you may not be able to invest those proceeds at or near the rate of interest that you are paying on the bonds, which is referred to as "negative arbitrage."

Tax Compliance Risk. The issuance of tax-exempt bonds is subject to a number of requirements under the United States Internal Revenue Code, as enforced by the Internal Revenue Service (IRS). You must take certain steps and make certain representations prior to the issuance of tax-exempt bonds. You also must covenant to take certain additional actions after issuance of the tax-exempt bonds. A breach of your representations or your failure to comply with certain tax-related covenants may cause the interest on the bonds to become taxable retroactively to the date of issuance of the bonds, which may result in an increase in the interest rate that you pay on the bonds or the mandatory redemption of the bonds. The IRS also may audit you or your bonds, in some cases on a random basis and in other cases targeted to specific types of bond issues or tax concerns. If the bonds are declared taxable, or if you are subject to audit, the market price of your bonds may be adversely affected. Further, your ability to issue other tax-exempt bonds also may be limited.

This description of tax compliance risks is not intended as legal advice and you should consult with your bond counsel regarding tax implications of issuing the bonds.

Accounts Payable

To Be Paid Proof List

User: bhannah
Printed: 10/13/2016 - 8:38AM
Batch: 00503.10.2016 - 10172016

Description		Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Ace Hardware							
000030							
Misc. Supplies		141.62	01-445-4421	Custodial Supplies	001	10/11/2016	10/17/2016
Fasteners		7.68	01-445-4510	Equipment/IT Maint	002	10/11/2016	10/17/2016
Fans		78.96	01-445-4870	Equipment	003	10/11/2016	10/17/2016
	Total:	228.26	***Vendor Total**				
Aflac							
030540							
Aflac Ins/October 2016		197.10	01-000-2053	AFLAC	226738	10/11/2016	10/17/2016
	Total:	197.10	***Vendor Total**				
AIM							
046510							
Flex125/Manko/10-14 Pay Period		106.25	01-000-2055	Payroll Deductions	10142016	10/12/2016	10/17/2016
	Total:	106.25	***Vendor Total**				
Anderson Pest Solutions							
019770							
Pest Control/Village Hall		123.33	01-445-4520	Public Buildings Rpr & Mtce	3992997	10/11/2016	10/17/2016
Pest Control/NAPD		91.00	01-445-4520	Public Buildings Rpr & Mtce	3994120	10/11/2016	10/17/2016
Pest Control/Treatment Plants		85.00	60-445-4567	Treatment Plant Repair/Maint	3994534	10/11/2016	10/17/2016
	Total:	299.33	***Vendor Total**				
Arbor Day Foundation							
039650							
Annual Membership		15.00	01-445-4390	Dues & Meetings		10/11/2016	10/17/2016
	Total:	15.00	***Vendor Total**				
AT&T Global Services, Inc.							
023770							
Maintenance contract/Oct 2016		157.17	01-430-4651	Telephone	IL826553	10/11/2016	10/17/2016
	Total:	157.17	***Vendor Total**				
Aurora Area Spring Co.							
003420							
Brake Valve Adaptor/Truck #178		350.80	01-445-4511	Vehicle Repair and Maint	058289	10/11/2016	10/17/2016

Description	Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Total:	350.80	***Vendor Total**				
BDK Door Company						
030150						
Re-Key Census Doors	145.00	01-445-4520	Public Buildings Rpr & Mtce	14926	10/11/2016	10/17/2016
Total:	145.00	***Vendor Total**				
Bill Hannah						
033630						
IGFOA Conference/Mileage Reimbursement	123.12	01-430-4370	Conferences & Travel	mileage/hanna	10/12/2016	10/17/2016
Total:	123.12	***Vendor Total**				
Camic Johnson, LTD.						
03989						
Hearing Officer/Code Hearings	350.00	01-441-4506	Publishing	8/18, 9/15 201	10/11/2016	10/17/2016
Total:	350.00	***Vendor Total**				
Canon Solutions America, Inc.						
034960						
Copier Maintenance/Sept 2016/NAPD	159.63	01-440-4510	Equipment/IT Maint	4020346520	10/11/2016	10/17/2016
Total:	159.63	***Vendor Total**				
CCS Contractor Equipment						
045420						
Replacement Parts/Sledge Hammer	282.50	01-445-4543	Sidewalks Rpr & Mtce	11682953	10/11/2016	10/17/2016
Total:	282.50	***Vendor Total**				
Cintas Corporation #344						
041590						
Extinguisher Inspection/Wtr Trmnt Plnt	65.00	60-445-4567	Treatment Plant Repair/Maint	F9400151109	10/11/2016	10/17/2016
Extinguisher Inspection/Garage	170.96	01-445-4520	Public Buildings Rpr & Mtce	F9400151475	10/11/2016	10/17/2016
Extinguisher Inspection/VH	185.72	01-445-4520	Public Buildings Rpr & Mtce	F9400151476	10/11/2016	10/17/2016
Total:	421.68	***Vendor Total**				
City of Aurora						
027870						
Dispatch Fees 2015	146,175.34	01-440-4652	Communications	182964	10/11/2016	10/17/2016
Total:	146,175.34	***Vendor Total**				
CODE 4, Public Safety Emblems						
047940						
New Sgt. Chevrons	975.00	01-440-4160	Uniform Allowance	C4-0483	10/11/2016	10/17/2016
Total:	975.00	***Vendor Total**				

Description		Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Coffman Truck Sales, Inc.							
000320							
Safety Test/Truck #176		21.50	01-445-4511	Vehicle Repair and Maint	1001075451	10/11/2016	10/17/2016
Safety Test/Truck #188		32.00	01-445-4511	Vehicle Repair and Maint	1001075491	10/11/2016	10/17/2016
Safety Test/Truck #180		21.50	01-445-4511	Vehicle Repair and Maint	1001075498	10/11/2016	10/17/2016
	Total:	75.00	***Vendor Total**				
Comcast Cable							
040740							
Internet/NAPD		222.80	01-440-4652	Communications		10/11/2016	10/17/2016
	Total:	222.80	***Vendor Total**				
Commercial Tire Services, Inc.							
038680							
Flat Repair/NAPD		71.75	01-440-4511	Vehicle Repair and Maint	3330012225	10/11/2016	10/17/2016
	Total:	71.75	***Vendor Total**				
Commonwealth Edison							
000330							
Streetlights/355 Moorfield		8.14	10-445-4660	Street Lighting and Poles	0795092063	10/11/2016	10/17/2016
Streetlights/1197 Comiskey Ave		8.14	10-445-4660	Street Lighting and Poles	0903075187	10/11/2016	10/17/2016
Streetlights/1193 Comiskey Ave		8.14	10-445-4660	Street Lighting and Poles	1743032047	10/11/2016	10/17/2016
Streetlights/211 River Road		3,497.46	10-445-4660	Street Lighting and Poles	4007024020	10/11/2016	10/17/2016
	Total:	3,521.88	***Vendor Total**				
Communications Revolving							
007390							
IWIN		754.32	01-440-4652	Communications	T1706913	10/11/2016	10/17/2016
	Total:	754.32	***Vendor Total**				
Concrete Cutting &							
026510							
Curb Sawing		600.00	01-445-4540	Streets & Alleys Rpr & Mtce	SSCU18165	10/11/2016	10/17/2016
	Total:	600.00	***Vendor Total**				
Don Mc Cue Chevrolet							
032700							
Squad Repair		643.40	01-440-4511	Vehicle Repair and Maint	CVCS477123	10/11/2016	10/17/2016
Squad Repair		604.31	01-440-4511	Vehicle Repair and Maint	CVCS477482	10/11/2016	10/17/2016
	Total:	1,247.71	***Vendor Total**				
Don's Sharpening Centre, Inc.							
008480							
Trimmer Replacement Parts		71.64	01-445-4510	Equipment/IT Maint	165654	10/11/2016	10/17/2016
	Total:	71.64	***Vendor Total**				

Description		Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Drendel & Jansons Law Group							
028580							
Comm Dev/No Aur Storage LOC		162.50	90-000-E223	310 S Lincolnway	092016 cd/loc	10/11/2016	10/17/2016
Comm Dev/Zoning/Annexation		739.50	01-441-4260	Legal	092016 cd/zn	10/11/2016	10/17/2016
General/Admn/Finance		2,116.50	01-430-4260	Legal	092016 gen a	10/11/2016	10/17/2016
General/NAPD		459.00	01-440-4260	Legal	092016 gen/n	10/11/2016	10/17/2016
Legal/NAPD		1,912.50	01-440-4260	Legal	092016 napd	10/11/2016	10/17/2016
Legal Review/Water		68.00	90-000-E118	T-Mobile	092016 water	10/11/2016	10/17/2016
	Total:	5,458.00	***Vendor Total**				
Drydon Equipment, Inc.							
3395							
Pump Hoses/Oil for Feed Pumps		2,076.52	60-445-4567	Treatment Plant Repair/Maint	38816	10/12/2016	10/17/2016
	Total:	2,076.52	***Vendor Total**				
Dun Rite Enterprises							
000430							
Window Cleaning/August 2016/VH		450.00	01-445-4520	Public Buildings Rpr & Mtce	4412	10/11/2016	10/17/2016
	Total:	450.00	***Vendor Total**				
Dustcatchers & Logo Mat, Inc.							
023610							
Towel/Rug Cleaning/Garage		52.36	01-445-4520	Public Buildings Rpr & Mtce	22507	10/11/2016	10/17/2016
Towel/Rug Cleaning/Garage		52.36	01-445-4520	Public Buildings Rpr & Mtce	23111	10/11/2016	10/17/2016
	Total:	104.72	***Vendor Total**				
Dynegy Energy Services							
048750							
Well #7 8/11 - 9/9 2016		7,841.90	60-445-4662	Utility	0915059095	10/12/2016	10/17/2016
Well #4 8/8 - 9/6 2016		5,954.37	60-445-4662	Utility	1383089059	10/12/2016	10/17/2016
Wel #4/New Meter Mar/Apr '16		3,423.68	60-445-4662	Utility	1383089059/p	10/12/2016	10/17/2016
Well #5 8/9 - 9/7 2016		7,792.58	60-445-4662	Utility	3915126049	10/12/2016	10/17/2016
Well #3 8/8 - 9/6 2016		1,232.40	60-445-4662	Utility	5587066023	10/12/2016	10/17/2016
Well #6 8/8 - 9/1		3,479.82	60-445-4662	Utility	6707024008	10/12/2016	10/17/2016
	Total:	29,724.75	***Vendor Total**				
Feece Oil							
031060							
Mid Grade Fuel		3,006.51	71-000-1340	Gas/Diesel Escrow	3441701	10/11/2016	10/17/2016
	Total:	3,006.51	***Vendor Total**				
Fifth Third Bank							
028450							
IGFOA/Job Posting/UB		250.00	01-430-4506	Publishing/Advertising	BH092016001	10/12/2016	10/17/2016
Marriott/IGFOA Conference		436.80	01-430-4370	Conferences & Travel	BH092016002	10/12/2016	10/17/2016
Amazon/Cell Phone Accessories		37.98	01-430-4420	IT Supplies	DA092016003	10/12/2016	10/17/2016
Susteen/Software Renewal		1,294.00	01-440-4555	Investigations	DA092016002	10/12/2016	10/17/2016
Amazon/(2) Hard Drives/PD		126.98	01-440-4510	Equipment/IT Maint	DA092016002	10/12/2016	10/17/2016
Batteries Plus/Battery for ADT Door Sensor		5.95	01-430-4420	IT Supplies	DA092016004	10/12/2016	10/17/2016

Description	Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Subway/OEM/CERT Meals/NA Days	197.70	01-440-4799	Misc.	DC092016001	10/12/2016	10/17/2016
IL SOS/Reg Ren'l Service Fee	2.37	01-440-4799	Misc.	DC092016002	10/12/2016	10/17/2016
IL SOS/Reg Ren'l Car 62	101.00	01-440-4799	Misc.	DC092016003	10/12/2016	10/17/2016
Office Depot/Supplies	376.50	01-440-4411	Office Expenses	DC092016004	10/12/2016	10/17/2016
IL SOS/Reg Ren'l/Service Fee	2.37	01-440-4799	Misc.	DC092016005	10/12/2016	10/17/2016
IL SOS/Reg Ren'l/Car #61	101.00	01-440-4799	Misc.	DC092016006	10/12/2016	10/17/2016
Discount Filters/Refrigerator Filters	132.99	01-440-4799	Misc.	DF092016001	10/12/2016	10/17/2016
East China Inn/Meeting With Fire Chiefs	18.10	01-440-4390	Dues & Meetings	DS092016001	10/12/2016	10/17/2016
Wal-Mart/Office Supplies/Handouts	15.09	01-440-4411	Office Expenses	DS092016002	10/12/2016	10/17/2016
Turf Room/Meeting with Area Police Chiefs	27.31	01-440-4390	Dues & Meetings	DS092016003	10/12/2016	10/17/2016
mycharge.com/IT Battery Supplies	129.99	01-440-4510	Equipment/IT Maint	DS092016004	10/12/2016	10/17/2016
Amazon/IT Lighting Cables for iphones	42.14	01-440-4510	Equipment/IT Maint	DS092016005	10/12/2016	10/17/2016
Office Depot/IT Printer Toner Supplies	493.97	01-440-4411	Office Expenses	DS092016006	10/12/2016	10/17/2016
ILETSB/Conference	355.00	01-440-4370	Conferences & Travel	JDL092016001	10/12/2016	10/17/2016
IL TRIAD/Conference/Stecklein	115.00	01-440-4370	Conferences & Travel	JDL092016001	10/12/2016	10/17/2016
Brownell's/Firearms Equipment	207.80	01-440-4383	Firearm Training	JDL092016001	10/12/2016	10/17/2016
Hotel/Conference/Stecklein	275.72	01-440-4370	Conferences & Travel	JDL092016001	10/12/2016	10/17/2016
United Defense/Honor Guard Supplies	132.99	01-440-4799	Misc.	JG092016001	10/12/2016	10/17/2016
Glendale Parade/Honor Guard Supplies	493.00	01-440-4799	Misc.	JG092016002	10/12/2016	10/17/2016
Trident/Honor Guard Supplies	600.00	01-440-4799	Misc.	JG092016003	10/12/2016	10/17/2016
Batavia Creamery/Dry Ice/PWks Training	70.50	01-445-4380	Training	MG092016001	10/12/2016	10/17/2016
Alphabet Signs/Letters for Sign Board	119.74	01-445-4530	Public Grounds Rpr & Mtce	MG092016001	10/12/2016	10/17/2016
Josef's Elegante Meats/Planning Workshop	128.54	01-410-4280	Professional Consulting	SB092016001	10/12/2016	10/17/2016
Emerg Med Products/CERT Supplies	100.54	01-440-4558	Emergency Management	SBZ092016001	10/12/2016	10/17/2016
Emerg Med Products/CERT Supplies	192.80	01-440-4558	Emergency Management	SBZ092016001	10/12/2016	10/17/2016
Total:	6,583.87	***Vendor Total**				

Frost Electric Company, Inc.
021540

Repair Dam Lights	740.00	01-445-4530	Public Grounds Rpr & Mtce	6785	10/11/2016	10/17/2016
Streetlight Repairs	340.00	10-445-4661	Street Light Repair/Maint	6802	10/11/2016	10/17/2016
Total:	1,080.00	***Vendor Total**				

Gladstone Homes
031260

Bond Return 540 Sycamore	5,000.00	90-000-2225	Due To Others - Damage Bond	P#201307079	10/12/2016	10/17/2016
Bond Return 437 Sycamore	4,400.00	90-000-2225	Due To Others - Damage Bond	P#201507031	10/12/2016	10/17/2016
Bond Return 484 Mount	4,700.00	90-000-2225	Due To Others - Damage Bond	P#201508042	10/12/2016	10/17/2016
Total:	14,100.00	***Vendor Total**				

Griswold Feed & Seed Store
001770

Grass Seed & Straw	172.00	01-445-4540	Streets & Alleys Rpr & Mtce	11056	10/11/2016	10/17/2016
Total:	172.00	***Vendor Total**				

Hach Company
014100

Chlorine Reagent	448.41	60-445-4567	Treatment Plant Repair/Maint	10111442	10/11/2016	10/17/2016
Total:	448.41	***Vendor Total**				

Description		Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Harmonic Heating & Air Conditioning							
047680							
Reset Lost Setpoints		100.00	01-445-4520	Public Buildings Rpr & Mtce	12005	10/11/2016	10/17/2016
RTU #3 Repair/NAPD		3,680.00	01-445-4520	Public Buildings Rpr & Mtce	12008	10/11/2016	10/17/2016
RTU #1 Repair/NAPD		3,298.50	01-445-4520	Public Buildings Rpr & Mtce	12013	10/11/2016	10/17/2016
RTU #1 Repair/NAPD		100.00	01-445-4520	Public Buildings Rpr & Mtce	12013b	10/11/2016	10/17/2016
RTU #1 Cooling Repair/NAPD		563.00	01-445-4520	Public Buildings Rpr & Mtce	12108	10/11/2016	10/17/2016
	Total:	7,741.50	***Vendor Total**				
Harris Computer Systems							
041620							
Software Licenses/Cityview		4,900.00	71-430-4870	Equipment	CT030338	10/11/2016	10/17/2016
	Total:	4,900.00	***Vendor Total**				
Heartland Recycling							
046780							
Soil/Spoils Disposal/PWks		347.75	01-445-4540	Streets & Alleys Rpr & Mtce	16862 pwks	10/11/2016	10/17/2016
Soil/Spoils Disposal/Water		347.75	60-445-4568	Watermain Rprs. & Rplcmts.	16862 wtr	10/11/2016	10/17/2016
	Total:	695.50	***Vendor Total**				
Hey and Associates, Inc.							
040900							
Wetland Management		6,200.00	17-032-4533	Maintenance	16-0039-5880	10/11/2016	10/17/2016
	Total:	6,200.00	***Vendor Total**				
Hook-Fast Specialties, Inc							
010410							
Name Plates/NAPD		39.19	01-440-4160	Uniform Allowance	312172	10/11/2016	10/17/2016
	Total:	39.19	***Vendor Total**				
ILLCO Inc.							
040110							
(4) Ball Valves for Treatment Plants		85.80	60-445-4567	Treatment Plant Repair/Maint	1306872	10/11/2016	10/17/2016
Accuator Valves		773.61	60-445-4567	Treatment Plant Repair/Maint	1307091	10/11/2016	10/17/2016
	Total:	859.41	***Vendor Total**				
Illinois Power Marketing							
047570							
Streetlights/25 E State St		2,116.93	10-445-4660	Street Lighting and Poles	10392071609	10/11/2016	10/17/2016
	Total:	2,116.93	***Vendor Total**				
Industrial Door Company							
044430							
West Gate Repair/NAPD		356.00	01-445-4530	Public Grounds Rpr & Mtce	100069	10/11/2016	10/17/2016
	Total:	356.00	***Vendor Total**				

Description	Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Interstate Billing Service, Inc.						
049760						
Maint/Repairs to Trucks #170 and #176	8,549.85	01-445-4511	Vehicle Repair and Maint	09302016	10/12/2016	10/17/2016
Total:	8,549.85	***Vendor Total**				
K. Hovnanian Homes						
043570						
Bond Return 573 Moorfield	3,200.00	90-000-2225	Due To Others - Damage Bond	P#201602011	10/12/2016	10/17/2016
Bond Return 518 Moorfield	4,400.00	90-000-2225	Due To Others - Damage Bond	P#201604030	10/12/2016	10/17/2016
Bond Return 502 Moorfield	4,400.00	90-000-2225	Due To Others - Damage Bond	P#201604031	10/12/2016	10/17/2016
Bond Return 549 Moorfield	4,400.00	90-000-2225	Due To Others - Damage Bond	P#201605034	10/12/2016	10/17/2016
Total:	16,400.00	***Vendor Total**				
Kane County Recorder						
010600						
Legal Ad/De-Annexation	99.00	01-441-4506	Publishing	NAUR092016	10/11/2016	10/17/2016
Water Lien Releases	188.00	60-445-4506	Publishing	NAUR09302(	10/11/2016	10/17/2016
Total:	287.00	***Vendor Total**				
Konica Minolta						
024860						
Copier Charges/Sept 2016/VH	225.70	01-430-4411	Office Expenses	9002801693	10/11/2016	10/17/2016
Total:	225.70	***Vendor Total**				
Kurt Metallo						
050030						
(28) Stump Removals	2,470.00	01-445-4532	Tree Service	09302016	10/11/2016	10/17/2016
Total:	2,470.00	***Vendor Total**				
Lafarge Conco Western, Inc.						
033690						
Road Rock/Water	243.83	60-445-4568	Watermain Rprs. & Rplcmts.	706501731	10/11/2016	10/17/2016
Total:	243.83	***Vendor Total**				
Marberry Cleaners						
008430						
Prisoner Blanket Cleaning	60.00	01-440-4450	Prisoner Mtce & Supplies	54673	10/11/2016	10/17/2016
Total:	60.00	***Vendor Total**				
MB Financial Bank, N.A., as Escrowee						
038490						
NATC Rebate Dec 15 to Feb 16 Liability	83,936.56	01-490-4781	Sales Tax Rebates		10/12/2016	10/17/2016
Total:	83,936.56	***Vendor Total**				
Menards						
016070						

Description	Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Wood/Concrete Mix	56.96	01-445-4543	Sidewalks Rpr & Mtce	37742	10/11/2016	10/17/2016
Safety Shirts/Misc. Equipment	242.82	60-445-4160	Uniform Allowance	38076	10/11/2016	10/17/2016
Pick Hand Tool	21.97	01-445-4870	Equipment	38273	10/11/2016	10/17/2016
Sidewalk Repair	100.68	01-445-4543	Sidewalks Rpr & Mtce	38306	10/11/2016	10/17/2016
Cleaning Supplies/Safety Equipment	148.72	60-445-4567	Treatment Plant Repair/Maint	38887	10/11/2016	10/17/2016
Materials for #180 Leaf Box	69.04	01-445-4510	Equipment/IT Maint	39098	10/11/2016	10/17/2016
Total:	640.19	***Vendor Total**				
Miner Electronics Corporation						
3383						
Squad Repair/Car # 73	95.00	01-440-4511	Vehicle Repair and Maint	261601	10/11/2016	10/17/2016
Total:	95.00	***Vendor Total**				
Mooney & Thomas, Pc						
001040						
(2) payroll Check Writing/Sept 2016	580.00	01-430-4267	Finance Services	9163101	10/11/2016	10/17/2016
Police Pension Processing/Oct 2016	60.00	80-430-4581	Banking Services/Fees	9163105	10/11/2016	10/17/2016
Total:	640.00	***Vendor Total**				
Municode						
038650						
Ordinance Pages	625.80	01-410-4260	Legal	00275686	10/11/2016	10/17/2016
Total:	625.80	***Vendor Total**				
North Aurora NAPA, Inc.						
038730						
Hitch and Adaptor	169.61	01-445-4511	Vehicle Repair and Maint	238360	10/11/2016	10/17/2016
PN Clip	9.88	01-445-4511	Vehicle Repair and Maint	238395	10/11/2016	10/17/2016
Battery	222.14	01-445-4511	Vehicle Repair and Maint	238571	10/11/2016	10/17/2016
Battery	513.03	01-445-4511	Vehicle Repair and Maint	238589	10/11/2016	10/17/2016
Bulbs	80.46	01-440-4511	Vehicle Repair and Maint	238655	10/11/2016	10/17/2016
Oil Filter	22.12	01-445-4511	Vehicle Repair and Maint	238729	10/11/2016	10/17/2016
Oil Pressure Light	59.15	01-440-4511	Vehicle Repair and Maint	238804	10/11/2016	10/17/2016
Valve Cap	9.57	01-445-4511	Vehicle Repair and Maint	239169	10/11/2016	10/17/2016
Air Filters	88.54	01-445-4511	Vehicle Repair and Maint	240272	10/11/2016	10/17/2016
Washer Fluid/NAPD	70.35	01-440-4511	Vehicle Repair and Maint	240550 napd	10/11/2016	10/17/2016
Washer Fluid/PWks	70.35	01-445-4511	Vehicle Repair and Maint	240550 pwks	10/11/2016	10/17/2016
Back Up Alarm	40.40	01-445-4511	Vehicle Repair and Maint	240806	10/11/2016	10/17/2016
License Lamp	3.80	01-445-4511	Vehicle Repair and Maint	240849	10/11/2016	10/17/2016
LED Light Bulb/Plug	53.80	01-445-4511	Vehicle Repair and Maint	240851	10/11/2016	10/17/2016
Grommet & Lamp	6.99	01-445-4511	Vehicle Repair and Maint	240913	10/11/2016	10/17/2016
Grommet	2.38	01-445-4511	Vehicle Repair and Maint	240915	10/11/2016	10/17/2016
Total:	1,422.57	***Vendor Total**				
North East Multi-Regional						
001520						
Training Class (3)	150.00	01-440-4380	Training	211312	10/11/2016	10/17/2016
Total:	150.00	***Vendor Total**				

Description	Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Office Depot						
039370						
Easel/Markers/Calendar	58.79	01-430-4411	Office Expenses	86421843300	10/11/2016	10/17/2016
Pens	36.79	01-441-4411	Office Expenses	86421843300	10/11/2016	10/17/2016
Coffee/P Wks	107.97	01-445-4411	Office Expenses	86421843300	10/11/2016	10/17/2016
Misc Supplies	37.77	01-430-4411	Office Expenses	86673686500	10/11/2016	10/17/2016
Misc Supplies	37.77	01-441-4411	Office Expenses	86673686500	10/11/2016	10/17/2016
Misc Supplies	37.77	01-445-4411	Office Expenses	86673686500	10/11/2016	10/17/2016
Misc Supplies	37.77	60-445-4411	Office Expenses	86673686500	10/11/2016	10/17/2016
Stapler	5.06	01-430-4411	Office Expenses	86673743700	10/11/2016	10/17/2016
Staplers (2)	45.54	01-441-4411	Office Expenses	86673743700	10/11/2016	10/17/2016
Stapler	5.06	01-445-4411	Office Expenses	86673743700	10/11/2016	10/17/2016
Stapler	5.06	60-445-4411	Office Expenses	86673743700	10/11/2016	10/17/2016
Toner (3) Water	275.47	60-445-4411	Office Expenses	86759667100	10/11/2016	10/17/2016
Toner/Water	94.99	60-445-4411	Office Expenses	86759686400	10/11/2016	10/17/2016
Toner/Admin	119.98	01-430-4411	Office Expenses	86779625500	10/11/2016	10/17/2016
Office Supplies	24.50	01-430-4411	Office Expenses	86800632900	10/11/2016	10/17/2016
Office Supplies	24.49	01-441-4411	Office Expenses	86800632900	10/11/2016	10/17/2016
Office Supplies	24.50	01-445-4411	Office Expenses	86800632900	10/11/2016	10/17/2016
Office Supplies	24.49	60-445-4411	Office Expenses	86800632900	10/11/2016	10/17/2016
Planner/Misc. Supplies	29.22	01-430-4411	Office Expenses	86800637200	10/11/2016	10/17/2016
Misc. Supplies	7.63	01-441-4411	Office Expenses	86800637200	10/11/2016	10/17/2016
Misc. Supplies	7.63	01-445-4411	Office Expenses	86800637200	10/11/2016	10/17/2016
Misc. Supplies	7.63	60-445-4411	Office Expenses	86800637200	10/11/2016	10/17/2016
Total:	1,055.88	***Vendor Total**				
Paddock Publications, Inc.						
026910						
Ad for Bids/Road Marking	89.70	01-445-4506	Publishing	T4452014	10/11/2016	10/17/2016
Total:	89.70	***Vendor Total**				
Paddock Publications						
044240						
Subscription thru 11/26/16	50.00	01-410-4411	Office Expenses		10/11/2016	10/17/2016
Total:	50.00	***Vendor Total**				
Patten Industries, Inc.						
030840						
Equipment Rental/NA Days 2016	5,253.31	15-430-4751	North Aurora Days Expenses	39827	10/11/2016	10/17/2016
Total:	5,253.31	***Vendor Total**				
Preventative Maintenance Systems, Inc.						
050200						
Safety Lane/Truck #65	21.50	01-445-4511	Vehicle Repair and Maint	201327	10/11/2016	10/17/2016
Total:	21.50	***Vendor Total**				
Rush Truck Centers of Illinois Inc.						
046500						
Replace Cables/2004 International	3,328.25	01-445-4511	Vehicle Repair and Maint	3004010036	10/11/2016	10/17/2016

Description		Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
	Total:	3,328.25	***Vendor Total**				
Sikich LLP							
019090							
FY '!6 Audit Services Through 8/31		16,200.00	01-430-4265	Audit Services	267210	10/11/2016	10/17/2016
	Total:	16,200.00	***Vendor Total**				
Somonauk Water Lab, Inc.							
030510							
Monthly Water Samples		218.50	60-445-4562	Testing (water)	160960	10/11/2016	10/17/2016
	Total:	218.50	***Vendor Total**				
Suburban Laboratories, Inc.							
045300							
Testing/Well 3, ETP & WTP		555.00	60-445-4562	Testing (water)	138697	10/11/2016	10/17/2016
	Total:	555.00	***Vendor Total**				
TAPCO							
043400							
Sign/LED Replacement after accident		1,647.74	01-445-4545	Traffic Signs & Signals	1541805	10/11/2016	10/17/2016
	Total:	1,647.74	***Vendor Total**				
Teska Associates, Inc.							
024820							
Consulting/Planning/August 2016		1,049.34	01-441-4275	Planning	7200 cd	10/12/2016	10/17/2016
TIF Matters		420.00	12-438-4280	Professional/Consulting Fees	7200 tif	10/12/2016	10/17/2016
	Total:	1,469.34	***Vendor Total**				
The Janssen Avenue Boys							
049970							
Business Cards		987.50	01-440-4411	Office Expenses	9856	10/12/2016	10/17/2016
	Total:	987.50	***Vendor Total**				
Third Millennium Assoc. , Inc.							
033470							
Utility Billing/Past Due Bills		524.60	60-445-4507	Printing	19922	10/11/2016	10/17/2016
	Total:	524.60	***Vendor Total**				
Tri-County							
027350							
Sept Cutting/Water Wonder Maint		4,406.12	01-445-4531	Grass Cutting	16-10-5078	10/11/2016	10/17/2016
	Total:	4,406.12	***Vendor Total**				

Description		Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Trugreen							
045160							
Water Facility Lawn Treatment		103.00	60-445-4565	Water Well Rpr & Mtce	55039747	10/11/2016	10/17/2016
	Total:	103.00	***Vendor Total**				
Verizon Wireless							
025430							
Village Cell Phones/Usage		163.50	01-430-4652	Communications	9771960993a	10/12/2016	10/17/2016
Village Cell Phones/Usage		342.93	01-440-4652	Communications	9771960993b	10/12/2016	10/17/2016
Village Cell Phones/Usage		165.49	01-441-4652	Communications	9771960993c	10/12/2016	10/17/2016
Village Cell Phones/Usage		140.22	01-445-4652	Communications	9771960993d	10/12/2016	10/17/2016
Village Cell Phones/Usage		116.73	60-445-4652	Communications	9771960993e	10/12/2016	10/17/2016
Village Cell Phones/Usage		30.02	01-430-4652	Communications	9771960994a	10/12/2016	10/17/2016
Village Cell Phones/Usage		101.82	01-445-4652	Communications	9771960994b	10/12/2016	10/17/2016
Village Cell Phones/Usage		67.79	60-445-4652	Communications	9771960994c	10/12/2016	10/17/2016
Village Cell Phones/Usage		109.61	01-440-4652	Communications	9771960994d	10/12/2016	10/17/2016
	Total:	1,238.11	***Vendor Total**				
Vessel, Inc.							
041490							
Topsoil		276.00	60-445-4568	Watermain Rprs. & Rplcmts.	16-1764	10/11/2016	10/17/2016
	Total:	276.00	***Vendor Total**				
Water Products Company							
001170							
Water Service Parts		41.54	60-445-4568	Watermain Rprs. & Rplcmts.	0269065	10/11/2016	10/17/2016
3/4" Service Parts		72.56	60-445-4568	Watermain Rprs. & Rplcmts.	0269146	10/11/2016	10/17/2016
B-Box Key		45.00	60-445-4568	Watermain Rprs. & Rplcmts.	0269303	10/11/2016	10/17/2016
	Total:	159.10	***Vendor Total**				
Water Resources							
010380							
Meter Seal Wire		169.97	60-445-4480	New Meters,rprs. & Rplcmts.	30860	10/11/2016	10/17/2016
(2) 3" Meter Sets		5,400.00	60-445-4480	New Meters,rprs. & Rplcmts.	30860	10/11/2016	10/17/2016
	Total:	5,569.97	***Vendor Total**				
Weilandt Legal Document Svcs.							
038240							
Record Minutes/CD Adjudication		84.00	01-441-4506	Publishing	16-0821	10/11/2016	10/17/2016
	Total:	84.00	***Vendor Total**				
Weldstar Company							
014090							
Quarterly Cylinder Rental		92.00	01-445-4510	Equipment/IT Maint	01552100	10/11/2016	10/17/2016
	Total:	92.00	***Vendor Total**				

Description	Amount	Account	Acct Name	Invoice #	Inv Date	Pmt Date
Xerox Corporation						
040890						
Copier Maintenance/NAPD	85.00	01-440-4510	Equipment/IT Maint		10/11/2016	10/17/2016
Total:	85.00	***Vendor Total**				
Report Total:	401,825.71					